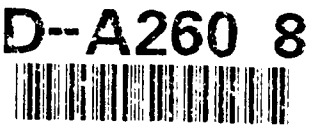

NAVAL POSTGRADUATE SCHOOL
MONTEREY, CALIFORNIA

THESIS

DETERMINING THE FUTURE OF THE US SUBMARINE FORCE

by

Brian Thomas Howes

December 1992

Thesis Advisor: **James J. Tritten**

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The end of the Cold War has been the watershed event for changes in the international and national security environments that present tremendous implications for the US submarine force. These changes include calls for significant US defense cuts to reap a "peace dividend," the increasing importance of economics as a *determinant* of defense spending, and the disintegration of the Soviet Union resulting in the absence of a clear tangible global threat to US national interests. What has resulted from these changes is the formulation of a new US national security strategy that focuses on regional contingencies, and the decision to cut US defense forces by at least 25% over five years including the cancellation of the *Seawolf* submarine program. This thesis addresses the implications of these tremendous changes on the US submarine force. Specifically, issues that are addressed include roles and missions, force structure, submarine design, and changing the institutional mindset of the submarine community. The issue of roles and missions involves demonstrating the applicability of the submarine to regional warfare. The issue of submarine force structure deals with both the short term and long term factors affecting submarine force reductions and ultimate submarine force size. The issue of submarine design addresses concerns over the submarine industrial base, the *Centurion* program, and design requirements for a regional warfighting submarine. The need to change the institutional mindset of the submarine community is addressed to illuminate the fact that in order to adapt to and absorb the enormous changes occurring in the international environment, the submarine community also must change.

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Determining the Future of the US Submarine Force

by

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Submitted in partial fulfillment of the
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ABSTRACT

The end of the Cold War has been the watershed event for changes in the international and national security environments that present tremendous implications for the US submarine force. These changes include calls for significant US defense cuts to reap a "peace dividend," the increasing importance of economics as a *determinant* of defense spending, and the disintegration of the Soviet Union resulting in the absence of a clear tangible global threat to US national interests. What has resulted from these changes is the formulation of a new US national security strategy that focuses on regional contingencies, and the decision to cut US defense forces by at least 25% over five years including the cancellation of the *Seawolf* submarine program. This thesis addresses the implications of these tremendous changes on the US submarine force. Specifically, issues that are addressed include roles and missions, force structure, submarine design, and changing the institutional mindset of the submarine community. The issue of roles and missions involves demonstrating the applicability of the submarine to regional warfare. The issue of submarine force structure deals with both the short term and long term factors affecting submarine force reductions and ultimate submarine force size. The issue of submarine design addresses concerns over the submarine industrial base, the *Centurion* program, and design requirements for a regional warfighting submarine. The need to change the institutional mindset of the submarine community is addressed to illuminate the fact that in order to adapt to and absorb the enormous changes occurring in the international environment, the submarine community also must change.

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The issue of roles and missions involves demonstrating the applicability of the submarine to the new regional defense strategy. The submarine does have a role in all four foundations of this strategy: forward presence, crisis response, strategic deterrence and defense, and reconstitution. With the exception of deterrence, these roles and missions involve primarily regional warfare or deterring a future emergent global threat. The submarine is a significant contributor to the new regional defense strategy. It provides unique and multiple mission capabilities to US regional warfighting forces.

The issue of submarine force structure deals with the short term and long term factors affecting submarine force reductions, ultimate submarine force size

and the future utilization of submarines in support of the regional defense strategy. The short term factors are primarily economic and political, and affect the rate of reduction or glide slope of submarine force level reductions. These factors include the large costs associated with retiring nuclear submarines compared to their operating costs, the need for maintaining the viability of the submarine industrial base, and the stability of the international environment in allowing further cuts in US defense capability. The long term factors affect the ultimate size of the regional defense submarine force. The primary factors in the long term will be the submarine industrial base that will set the minimum for the force, Navy and unified CINC requirements that will set the maximum for the force, and federal and defense budget constraints that will tend to limit the size of the force. Submarine organization in the future must be transformed in order to fully exploit the potential of the submarine in joint integrated operations while at the same time maintaining the ability to operate independently. This will require the integration of submarines into the surface community's cruiser-destroyer group organizations to support joint operations, while at the same time organizing the remaining submarines into strike squadrons that will assume the independent roles and missions of the submarine force.

The issue of submarine design addresses concerns over the submarine industrial base, the *Centurion* program, and design requirements for a regional warfighting submarine. The primary short term factor affecting submarine design will be maintaining the submarine industrial base. This will require a dependence on previous designs to ensure an affordable and effective *Centurion* program. Related to this is the need to concentrate submarine designs on affordability. Other short term factors include the need to begin the transition of

submarine design to regional warfighting emphasis, and concern over sending the wrong signal to the Russian military by continuing to build submarines designed against them. In the long term, the primary factor affecting submarine design will be the need for a comprehensive assessment of requirements for a regional warfighting submarine. This assessment should include propulsion, weapons capability, sensors and electronics, and platform requirements. In addition to designing for a regional warfighting submarine there will remain a requirement in the future to retain submarine design flexibility to respond to rapid changes in the international environment.

The need to change the institutional mindset of the submarine community is addressed in order to illuminate the fact that in order to adapt to and absorb the enormous changes occurring in the international environment, the submarine community must change as well. These changes include changing the frame of reference of the community, shedding the traditional shroud of secrecy surrounding submarine operations and capabilities, and engaging the Congress in the decision making processes of the submarine force from the outset.

It is vital that the leaders of the submarine community develop a long term vision that encompasses and addresses these issues and sets the proper course for the submarine force in its transition from a Cold War posture to a regional defense posture. This vision of the future is already well on the way to being articulated and implemented by the leaders of the submarine community. It is important that the submarine community embrace this sudden and dramatic transformation rather than resist it. The choice is clear. The submarine force can be the major determinant of its own future, or else it can resist change and let others determine the path of the submarine force of the future.

I. THE FUTURE IS NOW

A. INTRODUCTION

The Cold War is over and suddenly the United States finds itself facing fundamental questions concerning its role in the new world order. Finding answers to these complex questions is made all the more difficult by a domestic environment that is increasingly pressing for change. This pressure is resulting from concerns about the US economy and in calls for the reaping of a "peace dividend" following the end of the Cold War. The fact that this debate is occurring during a presidential election year tends to make the pressure even more intense. The outcome of this debate will have serious implications for the US military.

The US military was not immune from economic or political considerations even during the Cold War. Issues related to national defense were common foundations of presidential campaigns, including the purported "missile gap" during the 1960 campaign and the issue of US military weaknesses during the 1980 campaign.[1] In the past there was a common underlying factor; that of the threat of the Soviet Union. The Soviet Union provided comfortable boundaries for all debates concerning US national security and military strategies. The military directed virtually all of its efforts towards countering the Soviet threat. The strategy of containment, as developed in the late 1940s, was clearly necessary

[1]For further discussion of the impact of political campaigns on defense decisions see Desmond Ball, *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration* (Berkeley: University of California Press, 1980); and Strobe Talbott, *Deadly Gambits: The Reagan Administration and the Stalemate in Nuclear Arms Control* (New York and Toronto: Random House, 1985).

during the Cold War.[2] Now that the Cold War is over, however, the combination of the prolonged consistency of the threat and the subsequent exclusive focus of the nation has produced undesired effects. The public, conditioned for generations to justify military expenditures in terms of the Soviet threat, is now questioning the purpose of the decidedly large US military establishment.

Today, the Soviet Union has collapsed under the weight of its own economic troubles. The former members of the Warsaw Pact are struggling to rebuild their societies based on democratic and free market systems. The last bastions of communism are focusing their attention inward in their attempts to stem growing desires for freedom and prosperity. The world has become devoid of a tangible, easily recognizable threat to American ideals.

The United States government has reacted to the changing events throughout the world, as well as to the concerns of its people, by proposing a new regional defense strategy.[3] This strategy recognizes the decline of what remains of the Soviet Union as a threat and the emergence of regional crises as the new focus of US national security concerns. As a result of the reduced threat, the new strategy also proposes to decrease the size of the military by 25-30%. Each military service faces tough decisions concerning its contribution in the post-Cold War world. Included in these decisions is the applicability of weapon

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[2]See National Security Council, *The Report by the Secretaries of State and Defense on 'United States Objectives and Programs for National Security,' April 7, 1950 (NSC-68)* (Washington, D.C. : GPO, 1950); and Mr. X (George F. Kennan), "Sources of Soviet Conduct," *Foreign Affairs* 25 (July 1947): 572-82.

[3]See President, *National Security Strategy of the United States* (Washington, D.C. : GPO, 1991). For the purposes of this thesis, the term "regional defense strategy" is synonymous with "new national security strategy."

systems which were designed for the Cold War context to the threats of regional contingencies. The US attack submarine is an excellent example of a weapon system strongly associated with a Cold War mission.[4] The US Navy is now facing fundamental questions involving the future of the submarine in this new international security environment.

How, then, does the submarine fit into this new international security environment? The major issues that must be addressed to answer this question involve future roles and missions, force structure considerations, future design requirements, and justification of the program. It is important to note that these issues are not unique to the submarine force. In fact, every service is currently evaluating its own weapons systems to determine their roles in the new world order. This thesis, by concentrating on the submarine force, should not be misinterpreted as advocating the submarine over other weapons systems. The approach used in this research instead has been to determine the contributions of the submarine to the ability of the US armed forces to defend and promote national security interests. Thus, this thesis can be seen as one element of the strategic planning process, that theoretically starts with the enunciation of national security interests, leads to the development of a national military strategy, and then progresses to the determination of individual elements of that strategy and associated force structure. Needless to say, with the dust still settling on the end of the Cold War, the strategic planning process for the future of US armed forces is very dynamic and far from complete.

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[4]For an example of the debate that occurred over the *Seawolf* program, see James J. Kilpatrick, "Seawolf Sub: A $2 Billion Baby the Navy doesn't need," *Norfolk Virginian-Pilot*, 12 September 1991. (Reprinted in its entirety in *The Submarine Review*, (October 1991): 17-22.)

The purpose of this introductory chapter is to provide some general insight into the current state of the development of US national security strategy since the end of the Cold War. This chapter first looks at the sources of change in the international system which are driving the need to transform the military. What has not changed, i.e. the sources of continuity, in the international system are then addressed. The fundamental concepts of the regional defense strategy are presented to provide the strategic context for discussing the submarine's role, including a description of the *National Military Strategy* and the Navy's. . . *From The Sea: Preparing the Naval Service for the 21st Century.*[5] Given this background, the thesis then explores the most pressing issues facing the US submarine force in this new international security environment.

B. SOURCES OF CHANGE

The most obvious change in the international system has been the end of the Cold War. What exactly does that mean? On a large scale, the Cold War was a conflict of ideologies. Unresolvable ideological differences were the source of the military, political, and economic tensions that were evident for forty-five years. These tensions led ultimately to the creation and maintenance of powerful arsenals capable of tremendous destruction. Today with the collapse of communism in the former Soviet Union, the source of the Cold War has faded if not disappeared.

The end of the Cold War has resulted in a change of focus in terms of United States national security. We now concern ourselves less with a global adversary

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[5]General Colin L. Powell, *National Military Strategy 1992* (Washington D.C. : GPO, January 1992); and Department of the Navy, . . . *From The Sea: Preparing the Naval Service for the 21st Century* (Washington, D.C.: US Department of the Navy, 30 September 1992).

capable of destroying our country and more with lesser adversaries capable in the near term of threatening our regional national interests and in the long term of threatening the United States itself. All the while the United States must keep a wary eye on the international environment to ensure that we can maintain our security in the face of an emergent or remilitarized global threat.

Another effect of the end of the Cold War has been to raise the importance of concerns that were previously secondary.[6] Economics has always been a constraint upon military expenditures. Now, however, the domestic issues of a growing budget deficit and a persistent recession are becoming more important, especially due to election year politics. The result has been that economics is becoming more of a *determinant* of defense spending rather than a constraint.[7] Related to the issue of economics and the end of the Cold War is the issue of forward military basing. Now that the primary threat has abated and with budgetary funds becoming increasingly scarce, the need for these bases is being called into question. As a result, the United States is in the process of reducing or eliminating many of its foreign bases.[8] The future role of the United States in this new world order is still the subject of considerable debate, as evidenced by the discussion that resulted from leaks of the drafts of the past year's Defense

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[6]See "Remarks by General Colin L. Powell, Chairman of the Joint Chiefs of Staff, to the Washington Chapter of the Armed Forces Communications and Electronics Association (AFCEA) -- The Shoreham Hotel, 14 December 1990," as delivered, 29 pp.

[7]For an example of defense decisions based on economic determinants see William W. Kaufmann and John D. Steinbruner, *Decisions for Defense: Prospects for a New Order* (Washington, D.C. : The Brookings Institution, 1991); and William W. Kaufmann, *A Thoroughly Efficient Navy* (Washington, D.C. : The Brookings Institution, 1987). For the effect of economic constraints on the Navy in particular see Harlan K. Ullman, *In Harm's Way: American Seapower and the 21st Century* (Silver Springs, MD: Bartleby Press, 1991).

[8]See "Pentagon Adds 83 Bases to Europe Cutbacks: Military Speeds up Reductions Following End of Cold War," *Washington Post*, 31 January 1992, p. 6(A).

Planning Guidance.[9] In the short term it appears that US political commitments will be largely unchanged. If this continues in the long run, then the United States, by reducing overseas bases, is depriving itself of a means of influencing international events. A possible result of this is that there will be an increasing reliance on naval forces to influence events abroad.

On the military level, what has been the effect of the end of the Cold War? The *National Military Strategy* describes this rather clearly.[10] It calls for reduced armed forces capable of meeting the military requirements of the new regional defense strategy. These forces will be capable of supporting the four pillars of the strategy, namely: deterrence and strategic defense, crisis response, forward presence, and reconstitution.[11]

From the perspective of the Navy, many of its global commitments currently remain unchanged, yet they will meet these commitments with fewer ships and personnel. What had been the goal of 600 ships is now 450 and even that may be wishful thinking.[12] The Maritime Strategy, which focused on global conventional conflict with the Soviet Union, is now on the shelf in the event of a

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[9]See "Pentagon Imagines New Enemies to Fight in Post-Cold War Era: Plans for Hypothetical Conflicts and Big Budgets," *New York Times*, 17 February 1992, p. 1(A); and Patrick E. Tyler, "U.S. Strategy Plan Calls for Insuring No Rivals Develop," *New York Times*, 9 March 1992, p. 1(L).

[10]*National Military Strategy 1992*, 1.

[11]Ibid., preface.

[12]The Congressional Budget Office has projected future navy strength at 310 ships based on current programming, see Congress, Congressional Budget Office, *Statement of Robert F. Hale, Assistant Director, National Security Division, Congressional Budget Office, Before the Subcommittee on Projection Forces and Regional Defense, Committee on Armed Services, United States Senate* (Washington, D.C.: CBO, 1991); Harlan Ullman predicts a force of 300 ships by the year 2000, see *In Harm's Way*, 184.

resurgent global threat.[13] What has emerged in its place is . . . *From The Sea: Preparing the Naval Service for the 21st Century*, that places a renewed emphasis on crisis response and forward presence in order to focus on the more likely threat of regional conflict.[14] The Navy, like its fellow services, is grappling with the need to reduce expenditures. The *Seawolf* class submarine program appears to be one of many victims of this desire to cut costs.[15]

In summary, the end of the Cold War has been the watershed event for the dramatic reshaping of both the national and international environments. It has required the United States to shift its focus from a global perspective based on containment of communism to a concern over regional contingencies. As a result of this shift, the US armed forces are undergoing a reduction in force structure that is requiring tough choices concerning future programming. Making these decisions more complex is the rise in importance of the economic costs of maintaining US defense forces. President Bush responded to these international changes with a new regional defense strategy and General Colin Powell with a new *National Military Strategy* that both outline a planned reduction of forces that will still support our various interests throughout the world. Meanwhile, the

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[13]H. Lawrence Garrett III, Admiral Frank B. Kelso II, and General A. M. Gray. "The Way Ahead." *US Naval Institute Proceedings*, April 1991, 38; "the maritime strategy itself remains on the shelf, with Atlantic and Pacific operations plans as bookends, ready to be retrieved if a global threat should reemerge."

[14]See . . . *From The Sea*, 1.

[15]For further explanation of the budget cuts following the President's State of the Union address see Department of Defense News Briefing, "DoD Budget Briefing with Secretary of Defense Dick Cheney, Deputy Secretary of Defense Donald Atwood, General Colin Powell, Chairman, JCS, Wednesday, January 29, 1992."

individual services are still grappling with tailoring their forces to meet the new strategy.[16]

C. SOURCES OF CONTINUITY

Given that these enormous changes have occurred, what has remained the same? On the international level, the United States remains deeply involved. Unlike the situation following World War I, the United States does not seriously have the option of retreating to its shorelines and focusing its attention only on itself. The world has become smaller even during the Cold War through increasing economic and political interdependence. Now with the collapse of communism, the need for international political cooperation has grown tremendously due to the need to support and encourage the fledgling democracies in Eastern Europe and the former Soviet Union.[17] Thus the political and economic commitments of the United States have not been reduced with the end of the Cold War. They have become even larger and more vital.[18] Concurrently, the need for some form of military forces to support these commitments has not disappeared. Some have hailed the end of the Cold War as the end of all sources of conflict. Certainly, the end of the Cold War is the end of a major source of conflict, but not the end of all sources of conflict. The tensions between the superpowers inhibited regional conflicts due to the fear of escalation

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[16]For an example of the initial efforts of the services to develop a strategy for the post-Cold War era, see Department of the Air Force, *The Air Force and U.S. National Security: Global Reach - Global Power* (Washington, D.C.: Department of the Air Force, June 1990).

[17]*National Military Strategy 1992*, 1.

[18]This is the argument of Richard M. Nixon in *Seize the Moment: America's Challenge in a One-Superpower World* (New York: Simon & Shuster, 1992).

to global war and nuclear Armageddon.[19] The overbearing concerns of the superpower conflict did little to eliminate the sources of regional conflict, only to prevent them from breaking out or escalating. Now, in this new world order, we see the removal of the blanketing effect of the Cold War, and the rekindling of regional conflicts that have been smoldering for the past forty-five years. Yugoslavia and the Gulf War are but two of a growing number of examples of post-Cold War regional conflicts. As the *National Military Strategy* points out, the need for military forces to face these new realities has been reduced but not eliminated.[20]

While tremendous changes have been occurring throughout the world, the United States military has remained a stabilizing source of strength. As our adversary of the past forty-five years crumbled before our very eyes, our capability was at its highest levels ever. American military successes demonstrated this in Operation Desert Storm. We find ourselves in a similar military situation as we found ourselves after World War II. Because of an intense military competition we have amassed very large military forces. Now that the competition is over and our adversary is imploding, we find ourselves in the enviable position of being the only superpower in the world. Our forces, which were designed to meet the multiple threats of the Soviet Union, are now more than adequate to meet the regional threats that we now face.

The challenge to the US military today is to use its enormous advantage in military capability to allow a significant reduction in forces and not subsequently

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[19] *National Military Strategy 1992*, 2-4.

[20] Ibid., preface; "We can meet the challenges of the foreseeable future with a much smaller force than we have had in recent years."

put national security interests at unreasonable risk. This challenge involves finding ways to meet the demands of the *National Military Strategy* with weapon systems previously used only to counter the Soviet threat. At the same time, the military must formulate design criteria for the next generation of weapons systems to truly counter the new threat while meeting austere budget constraints. The role of the submarine is a good example of this challenge. The nuclear submarine was developed during the Cold War, and its multimission capability is a direct result of Soviet-American competition. Now with the end of the Cold War, the Navy must develop a strategy that uses its declining force structure to meet its considerable commitments, while formulating design criteria for future submarines that address the requirements of the new international security environment.

D. GOALS AND OBJECTIVES

The military element of the *National Security Strategy of the United States* builds upon four foundations or "pillars". These foundations are strategic deterrence and defense, forward presence, crisis response, and reconstitution.[21]

Strategic Deterrence and Defense. The former Soviet Union, despite its precipitous decline over the last year, still retains the capability to destroy the United States within hours. Clearly, however, the numbers of former Soviet nuclear forces are being reduced and may be reduced drastically in the future. Besides the nuclear weapons that remain in what was once the Soviet Union, an increasing number of potentially hostile states have developed, or are

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[21]The following discussion is summarized from the *National Military Strategy 1992*, 6-8; *National Security Strategy of the United States*, 25-31; and James J. Tritten, *Our New National Security Strategy: America Promises to Come Back* (Westport, CT and London: Praeger Publishers, 1992), 17-26.

developing, weapons of mass destruction and the means to deliver them over long distances.[22] This combination of the declining but still potent former-Soviet threat and the emerging Third World threat, requires that the United States retain a strong and credible nuclear deterrent and continue to develop means of defending against nuclear attacks on the United States, our forces overseas, and our allies. This must be done at the same time that we continue an unprecedented reduction of our nuclear arsenal.

Forward Presence. In this new era of regional threats the need for forward presence becomes even more important.[23] Yet defense cuts and the closing of many overseas bases have prompted the Department of Defense to reevaluate the traditional definitions of forward presence in order for the United States to continue to fulfill its many obligations.[24] Forward presence will continue to be a cornerstone of US national security policy, yet the challenge of this new era is to tailor our evolving force structure to allow us to meet our objectives.

Crisis Response. The shift in emphasis from a global war to regional contingencies has forced the United States to focus on the ability of its forces to respond quickly and decisively to regional crises. This focus recognizes the uncertainty of the threat and the short warning periods that may be involved in

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[22] *National Military Strategy 1992*, 6; William Matthews, "Renegade nations pose future nuke threat: Aspin," *Navy Times*, 7 October 1991; and Stan Weeks, "Crafting a New Maritime Strategy," *US Naval Institute Proceedings*, January 1992, 32.

[23] See *National Security Strategy of the United States*, "In a world less driven by an immediate, massive threat to Europe or the danger of global war, the need to support a smaller but *still crucial forward presence* and to deal with regional contingencies . . . will shape how we organize, equip, train, deploy and employ our active and reserve forces. (Emphasis added)," 25.

[24] This is discussed in Tritten's, *Our New National Security Strategy: America Promises to Come Back*, 25-26.

future crises. It also understands the reduction in force structure and capability of US forces.

Reconstitution. This aspect of our strategy was formulated in recognition of the implausibility of a global confrontation and our declining ability to meet that threat. In simple terms, reconstitution is necessary because, "we must preserve a credible capability to forestall any potential adversary from competing militarily with the United States."[25]

The *National Military Strategy* also discusses a set of Strategic Principles that are meant to build upon the four foundations discussed previously. Those principles are: readiness, collective security, arms control, maritime and aerospace superiority, strategic agility, power projection, technological superiority, and decisive force. "These principles capitalize on our enduring strengths, capture the key lessons learned from our victory in Desert Storm, and allow us to exploit the weaknesses of those who might challenge United States interests."[26]

. . . *From The Sea: Preparing the Naval Service for the 21st Century* builds upon the foundation provided by the *National Military Strategy* and addresses the role of maritime forces in defending US national security interests. It, like the *National Military Strategy*, focuses on regional contingencies. The objectives of maritime forces, according to . . . *From The Sea*, is to provide the nation with naval expeditionary forces that are 1) shaped for joint operations, 2) operating forward from the sea, and 3) tailored for national needs.[27] The thrust of these

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[25]*National Military Strategy 1992*, 7.

[26]Ibid., 8.

[27]See . . . *From The Sea*, 2.

objectives is to reinforce the unique contributions of maritime forces to regional warfare. "In addition to our traditional operational capabilities of forward deployment, crisis response, strategic deterrence, and sealift, four key operational capabilities are required to successfully execute the new direction of the Navy and Marine Corps: Command, Control, and Surveillance; Battlespace Dominance; Power Projection; and Force Sustainment."[28] . . . *From The Sea* provides the specific goals and objectives for maritime forces in the post-Cold War world. The next step of the strategic planning process is to determine the contribution of the various elements that make up maritime forces. This thesis will examine the specific contribution of the submarine in this new strategic framework.

E. DETERMINING THE CONTRIBUTION OF THE SUBMARINE

The transition of the submarine force from a Cold War posture to a regional defense strategy posture is already underway, despite the fact that clear endpoints are not necessarily developed yet. This thesis examines the factors affecting both the transition and the final endpoint of the submarine force concerning the following issues: roles and missions, force structure, and future submarine design. In addition, this thesis discusses the change of direction that is necessary in terms of the way the submarine force is viewed both from the perspective of the military and of the public. The goal of this thesis is to provide a broad overview of the direction of the submarine force in the future.

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[28]Ibid., 7.

II. ROLES AND MISSIONS

A. RELATING MEANS TO ENDS

The determination of submarine roles and missions in the post-Cold War world requires a common strategic framework for the estimation of future US national interests and defining goals and objectives. As discussed in the Introduction, this framework has been provided by the *National Security Strategy of the United States* (also known as the regional defense strategy), the *National Military Strategy 1992*, and . . . *From The Sea: Preparing the Naval Service for the 21st Century* [1] How can the submarine force support and reinforce these foundations of our national security strategy? First, what does the submarine contribute to this new strategy? and given that the four "pillars" of the regional defense strategy are the *ends*, how can the submarine contribute to the *means* with which to achieve them?

B. THE CONTRIBUTING CHARACTERISTICS AND CAPABILITIES OF THE NUCLEAR SUBMARINE

The nuclear submarine evolved during the Cold War under design requirements that sought to counter its toughest challenge, the Soviet nuclear submarine. The need to defeat the Soviet nuclear submarine required the development of the capability to operate far forward for extended periods of

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[1]See President, *National Security Strategy of the United States* (Washington, D.C. : GPO, 1991); General Colin L. Powell, *National Military Strategy 1992* (Washington D.C. : GPO, January 1992); and Department of the Navy, . . . *From The Sea: Preparing the Naval Service for the 21st Century* (Washington D.C. : US Department of the Navy, 30 September 1992).

time, and to respond quickly and flexibly to emergent threats.[2] By meeting these design criteria, the submarine developed the enduring characteristics of stealth, endurance, and agility.[3] In this new era of regional contingencies, the need for rapid sustained response and multiple mission capability is still paramount, and the submarine already has the means to meet the new challenge.

Stealth. From the invention of the submarine, one of its primary strengths has been its ability to conceal itself beneath the surface of the oceans. Nuclear propulsion enabled the submarine to use stealth not only in specified situations such as attack, or evasion, but as a permanent regimen from leaving port to just prior to returning. The technological advances associated with performing the anti-submarine warfare (ASW) mission have enabled the submarine to become virtually undetectable not only to the eye and to radar, but to sonar as well. This ability to operate with stealth provides the United States with a platform that can operate far forward in enemy waters for a variety of missions, and that retains significant survivability while doing so. The stealth capability of the submarine removes any requirement for defensive support, allowing it the ability to operate independently. The submarine's stealth capability is not threatened by the end of the Cold War. The end of the Cold War has reduced any incentives for pursuing countermeasures to the submarine threat. The need for solving the

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[2]For a summary of submarine characteristics, see Norman Friedman, *Submarine Design and Development* (Annapolis, MD: Naval Institute Press, 1984), 9-16.

[3]These characteristics and the discussion that follows are drawn from Department of the Navy, Assistant Chief of Naval Operations (Undersea Warfare), *Submarine Roles in the 1990's and Beyond* (Washington, D.C.: US Department of the Navy, 18 January 1992), 4-6.

"ASW problem" is no longer a pressing issue to the United States or the Soviet Union.[4]

Endurance. Nuclear power provides the submarine with the ability to conduct sustained operations in any part of the world's oceans without the need for logistical support. This ability to operate without support contributes to the submarine's operational independence.

Agility. The term agility refers to the submarine's unique blend of stealth, endurance, speed, multimission capability, readiness, and command, control and communications (C^3) capability. This combination provides the operational commander with a flexible weapons platform capable of responding rapidly to regional contingencies either independently or in support of joint operations.

The continuing evolution of the submarine has provided the United States with a naval platform capable of performing a variety of naval warfare tasks simultaneously. These include the fundamental naval warfare tasks of ASW, anti-surface warfare (ASUW), strike, and mine warfare, and the supporting naval warfare tasks of special warfare, ocean surveillance, and intelligence.[5] It is important to clearly develop how this multimission capability contributes to the four "pillars" of national defense.

C. FORWARD PRESENCE

The new definition of forward presence emphasizes the need to "show our commitment, lend credibility to our alliances, enhance regional stability, and

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[4]See H. Lawrence Garrett III, Admiral Frank B. Kelso II, and General A. M. Gray, "The Way Ahead," *US Naval Institute Proceedings*, April 1991, 42. *"Freed from a nearly full-time requirement to train for ASW in far-forward areas,* [the submarine] force now can be available for more regional power-projection and support missions. (Emphasis added)".

[5]See *Submarine Roles in the 1990's and Beyond*, 8.

provide a crisis-response capability while promoting US influence and access."[6] Traditionally, the carrier battle group (CVBG), Surface Action Group (SAG), and Amphibious Ready Group (ARG) provided the ships necessary to provide the presence commonly referred to as naval diplomacy or "gunboat diplomacy."[7] During the Cold War, the submarine was seldom considered a platform useful for gunboat diplomacy. Now, as the projected number of Navy ships continues to decline and the need for forward presence remains unchanged, the possibility of using the submarine for presence operations needs to be reevaluated.[8]

1. Peacetime Engagement (Naval Diplomacy)

According to Dr. Jan Breemer[9], there are generally three arguments used to "prove" that a submarine is "inherently unsuitable as a weapon of 'violent

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[6]*National Military Strategy*, 7.

[7]For further discussions of naval diplomacy and presence see, James Cable, *Gunboat Diplomacy 1919-1979* (London: The Macmillan Press, 1981); Edward N. Luttwak, *The Political Uses of Sea Power* (Baltimore: The Johns Hopkins University Press, 1974); and Barry M. Blechman and Stephen S. Kaplan, *Force Without War: U.S. Armed Forces As a Political Instrument* (Washington, D.C. : The Brookings Institution, 1978).

[8]The Senate Armed Services Committee has raised concerns over the Navy's ability to meet forward presence commitments using traditional methods, namely the carrier battle group. It has tasked the Department of Defense to submit a report outlining alternatives to the traditional method of providing forward presence. See "Senate Armed Services Committee Wants Examination of Naval Forward Presence," *Inside the Navy*, 17 August 1992, 5-6.

[9]The following discussion is based in large part on Jan S. Breemer, "Where are the Submarines? Deterrence, Naval Presence, and the Submarine Fleet," In *Proceedings of the Fifth Submarine Technology Symposium (U), 12-14 May 1992* , by the Naval Submarine League and Johns Hopkins University - Applied Physics Laboratory (Laurel, MD: Johns Hopkins University - Applied Physics Laboratory, 1992), 73-80, JHU/APL STD-R-2121; and on the master's thesis of Brent Alan Ditzler, "Naval Diplomacy Beneath The Waves: A Study of the Coercive Use of Submarines Short of War" (Master's thesis, Naval Postgraduate School, December 1989).

peace.'"[10] The first involves the fact that the submarine is not a visible threat. The second concerns the inability of the submarine to engage in "proportional" violence as is seen during periods of crisis short of war. The last argument relates to the first and involves the belief that the submarine lacks the physical appearance to "impress" and thus is incapable of sending a signal.[11]

The issue of visibility is based upon the interpretation of deterrence theory that, "in order for a threat . . to be credible and thus deter . . it must be *communicated* or *signaled* (Emphasis in original)."[12] From this interpretation has followed the concurrent belief that in order for a threat to be communicated or signaled, it must be visible. Proponents of this argument, which is used to dismiss the submarine as an instrument of naval diplomacy, apparently ignore a very important exception to this "rule" and at the same time invalidate the forces they seem to be defending. Since its first deployment on patrol in the early 1960s, the nuclear ballistic missile submarine (SSBN) has provided the United States with a deterrent whose credibility in large part was due to its *invisibility*. Due to the success of the submarine in "strategic gunboat diplomacy", is it not plausible that a submarine can provide the same deterrent effect in a regional situation? In a similar vein, if the need for visibility was that imperative for gunboat diplomacy, then it should be easily demonstrated that the traditional instruments used for naval diplomacy have indeed been visible to the opponent.

In thinking of gunboat diplomacy, one might conjure up images of the Great White Fleet and its trip around the world to show the US flag. Today, the

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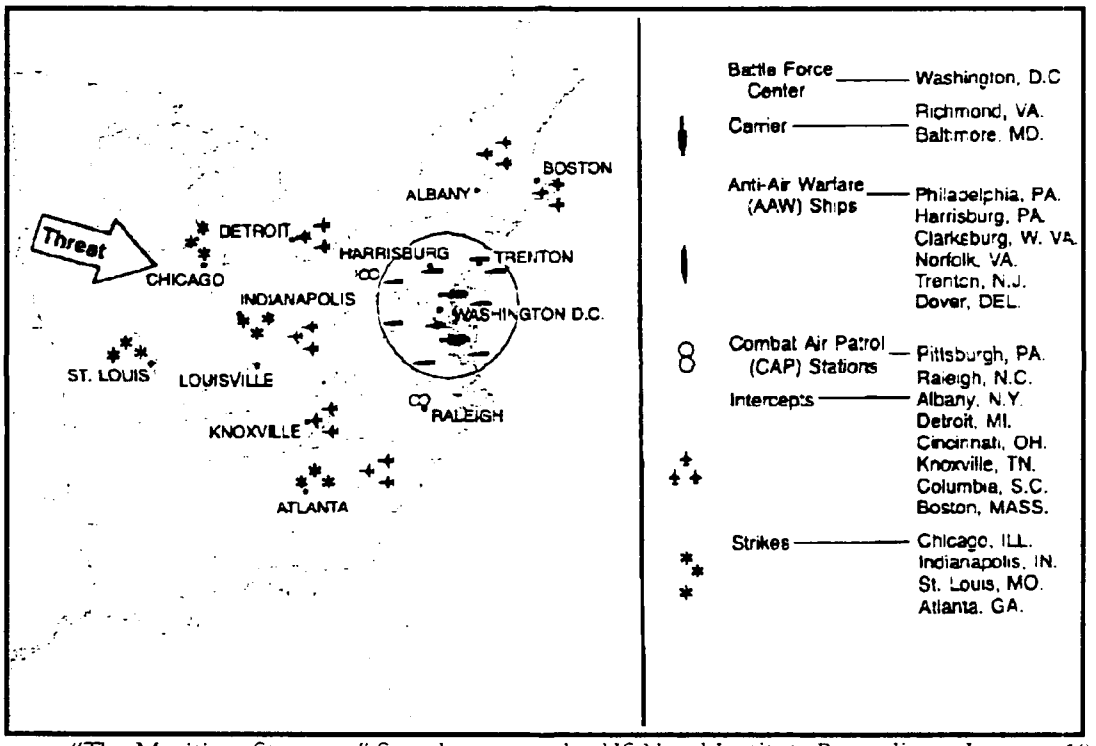
[10] Breemer, 7.

[11] Ibid., 7-9.

[12] Ibid., 9.

use of port calls to demonstrate intent is not a major factor in naval diplomacy.[13] What is predominantly used to signal intent is the stationing of naval forces in or near a region of current interest to the United States. Those not familiar with the naval service would be surprised to learn the area that a typical carrier battle group encompasses, let alone the distance from potentially hostile territory. The extent of this area is illustrated in Figure 1 below.

Figure 1. Carrier Battle Group Formation



Source: "The Maritime Strategy," Supplement to the *US Naval Institute Proceedings*, January 1986.

To say that the naval forces of the United States, except in unusual circumstances, are visible in the figurative term to potential adversaries is

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[13]Ibid.: "Foreign portcalls can be a part of naval influence-seeking, but they are peripheral to the problem of how naval forces can best deter or compel in an international crisis."

stretching the imagination. The need for a protective perimeter, as well as the recognition of territorial waters, precludes major naval vessels from approaching within visual distance of an opponent.[14] How then can the traditional "gunboats" of the US Navy signal or communicate intent without being seen? The answer lies not with the naval forces, but with the country using them to signal or communicate a threat. For the most part, US naval forces are visible to potential adversaries *because the United States government chooses them to be* through announcements, news coverage, etc. Using this method of making naval forces visible, the submarine is just as suitable a platform for naval diplomacy as other naval forces.[15] In fact, due to its stealth and survivability, the submarine brings a degree of stability to an otherwise potentially unstable crisis that surface vessels do not.[16]

The second argument against the use of submarines for presence operations is that the submarine is not capable of proportional violence. "The claim in this case is that the submarine is an all-or-nothing platform - it cannot fire a weapon without meaning to kill its target and therefore commit an act of war."[17] As a result of this, critics would say, the submarine is ineffective in situations where the opponent does not expect war to break out. This argument

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[14]Breemer, 11-12.

[15]This is the conclusion also of a recent Joint Staff study named *Potent Striker I*, "'Presence' does not require constant visibility. The mystique of a possible sub offshore can be exploited with proper PR/PSYOPS." See Department of Defense, Joint Staff, Deputy Director for Assessment/J8, "Final Report," *Potent Striker I* (Washington, D.C.: US Department of Defense, 1992), 2.

[16]Breemer, 12-15.

[17]Ibid., 18.

against the use of submarines for naval diplomacy is flawed for a number of reasons.

One can use the general theory of deterrence to demonstrate the lack of consensus on the "proportionality" issue. One school, referred to as the "finality of deterrence" school, believes that "successful deterrence hinges on the threatener's resolve to inflict punishment in-excess-of-the-crime."[18] According to this school, the threat of ultimate destruction, by whatever means, will successfully deter since the consequences of the response far outweigh the potential gains. The other deterrence school, the "credibility of deterrence" school, believes that deterrence is only successful if it is credible and thus relies heavily on the perceptions of the deteree. Following this line of reasoning, to be credible, the threats must be "proportionate" or "graduated."[19] In looking at these two schools of thought, one school would support the use of the submarine for naval presence due to the level of violence that the submarine represents. The other school, however, rejects the submarine due to its inability to inflict proportional violence. The proponents of arguments against submarines ignore the lack of consensus on this type of deterrence. Without consensus on what actually deters, the submarine cannot be discounted as a potential instrument of naval diplomacy based on this unresolved argument.

A specific example can also refute the argument of proportionality. The sinking of the Argentine cruiser *General Belgrano* by the British nuclear submarine

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[18]Ibid., 19

[19]Ibid.; and see also for further discussion of deterrence theory, Edward Rhodes, *Power and MADness: The Logic of Nuclear Coercion* (New York: Columbia University Press, 1989); and Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon* (Ithaca and London: Cornell University Press, 1989) and "Deterrence and Perception," *Strategy and Nuclear Deterrence* (Princeton: Princeton University Press, 1984).

Conqueror during the Falklands War is an example of a tactically *disproportionate* response, yet at the same time a striking example of a strategically appropriate response. The *Belgrano* was sunk with no warning and was not a direct threat to the British fleet. Thus, at a tactical level, the sinking was disproportionate. At the strategic level, however, the sinking of the *Belgrano* sent a clear signal to the Argentine Navy, which responded for the most part by staying in port for the duration of the war.[20] The importance of the example is that indeed the submarine played a significant role in signaling during the Falklands War with a level of violence that far exceeded that necessary for the tactical situation.

Another key point to realize in this discussion of the proportionality issue is the applicability of this argument to naval diplomacy. The use of "proportionate violence" in naval diplomacy involves only a limited number of cases, yet the submarine's inability to exercise it is being used to preclude the submarine from participating in naval diplomacy of any form. As Dr. Breemer points out, "The submarine may not be the platform-of-choice to enforce an embargo but this does not automatically exclude it from the whole spectrum of naval suasive tasks."[21] Additionally, as the missions of maritime forces continue to overlap with those of land-based ground and air forces, particularly concerning regional contingencies, it is difficult for any naval force today to inflict proportional violence. The primary example of this would be in the ability to strike land targets. Except for the 5" gun, the weapon of surface ships and submarines is the same: the Tomahawk cruise missile. Neither surface, aviation,

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[20]Breemer, 20.

[21]Ibid., 22.

or submarine forces possess a decided advantage in terms of proportionate violence when it comes to projecting power ashore.

It should be noted that the US submarine does not possess any "proportional response capability" due to the imperatives established by the Cold War. During the Cold War, there was no need for such a submarine weapon that would have arguably taken away storage for other more useful weapons. Now, in this post-Cold War world, the rationale for weapons capable of "proportional response" may be more compelling. The development and utilization of a submarine launched weapon capable of disabling other vessels would significantly improve the submarine's usefulness in counter-proliferation and forward presence operations.

The issue of the physical appearance of the submarine and its inability to impress can be similarly refuted. First, the use of the port call to signal intent is at the "bottom of the presence ladder"[22] and involves only a small portion of the total cases of naval diplomacy. Second, the belief that the submarine is ill-suited to that role is obviously not shared by the United States, itself having used submarines to signal intent in the past.[23]

During the Cold War, the role of submarines in naval diplomacy was not significant. This was due to the combination of the overriding mission requirements of the submarine force and the ability of other warfare communities in the Navy to meet naval diplomacy commitments. Now, in this post-Cold War era, we find the traditional mission requirements of the

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[22]Ibid., 23.

[23]The most striking example is the port visit of the USS Sam Houston, a Polaris SSBN, to Turkey in April 1963 that was used to signal support following the United States' removal of Jupiter missiles. (Cited in Breemer, 23; and *Submarine Roles in the 1990's and Beyond*, 10).

submarine are no longer as demanding, while the size of all forces of the US Navy are declining. To allow the United States to fulfill its requirements for presence, the previous exclusion of the submarine from the "presence club" must be reconsidered. This is not to presume that the submarine can replace the 'traditional' instruments of naval diplomacy, such as the carrier battle group or amphibious ready group. Instead, the submarine can be used in certain situations as independent actors, or more likely, in concert with other naval forces. The complementary role of the submarine is its strength in contributing to this traditional objective of forward presence.

2. Enhance Crisis Response Capability

During the Cold War, the US submarine force maintained a forward presence to fulfill its role in supporting nuclear deterrence and in providing crisis response against a Soviet threat. Now, with the focus on regional contingencies the submarine can continue to *contribute* to US crisis response capability by maintaining a forward presence, either as an independent or joint actor. In the submarine as an independent unit, the operational commander has a platform capable of providing ocean surveillance of potentially hostile ships, as well as a means of obtaining real-time intelligence without compromising surprise or escalating tensions. The independent submarine can also be relocated during the initial phases of a crisis to provide a wide range of prompt responses to the operational commander without employing more vulnerable and crisis-unstable forces. The submarine as an element of a maritime action group (MAG),[24] serves as an important force multiplier for the immediate operational capability of the

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[24]For a further discussion of the MAG concept, see Vice Admiral William Owens, "Mediterranean Fleet: A Test-bed for Navy's Future," *Armed Forces Journal*, July 1992, 32-35.

United States in a crisis region. Thus, the submarine force by maintaining forward deployed forces contributes to the rapid-response capability of US forces.

To summarize, the submarine force contributes to the national objective of forward presence through peacetime engagement, and by enhancing the US crisis response capability. The need to use the submarine for the role of peacetime engagement is becoming greater with the declining numbers of ships in the Navy. The submarine's potential as an instrument of naval diplomacy has been previously demonstrated. Yet it remains to be used for that purpose extensively. The 'traditional' role of the forward deployed submarine to enhance crisis response capability is being refocused from a Soviet threat to that of regional contingencies. This provides the operational commander with additional capabilities and significant flexibility in periods of rising tensions. The submarine is valuable in this role as a force multiplier for a maritime action group, and as a rapid response-capable forward element for a crisis response force. The submarine's enduring strengths make it a flexible platform capable of assuming independent or joint roles in support of forward presence. These roles are not dependent upon the threat from Russian naval forces and thus force levels supporting this role, which constitutes a unique area of US strategic competence, should remain constant or increase as the submarine's potential is tapped.

D. CRISIS RESPONSE

The value of the submarine in crisis response is its flexibility to operate independently or jointly as the situation requires.[25] This gives the submarine the ability either to respond quickly and operate in a hostile environment with no local maritime or aerospace superiority, or to operate in support of other maritime or ground based forces. In the first role, submarines would be sent to a crisis location before other forces to perform suppression of the opponent's offensive capabilities to allow easier ingress of follow-on forces to the region and to collect real-time intelligence of the situation for the operational commander. In joint operations, the submarine can simultaneously support both defensive and offensive tasks as designated by the joint force commander. The fundamental tasks that the submarine can perform in crisis response include ASW, ASUW, strike, mine warfare as well as the supporting tasks of special warfare, ocean surveillance, and intelligence.

ASW This traditional Cold War task of the submarine remains the same except for a change of venue from the Soviet Union to an unnamed regional contingency. The threat of diesel submarines in regional conflicts is real and complicates maritime operations when conducted in a regional scenario.[26] The submarine force has constantly trained for the task of forward ASW and would employ this capability in the offense suppression mission of initial crisis response. Following the ingress of all forces into the region and for the egress of

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[25]For an excellent description of the submarine in crisis response or regional warfare, see William J. Toti, "Sea-Air-Land Battle Doctrine," *US Naval Institute Proceedings*, August 1985, 70-74.

[26]For a description of the Third World submarine threat, see James Fitzgerald and John Benedict, "There Is A Sub Threat," *US Naval Institute Proceedings*, August 1990, 57-63.

forces following the conclusion of the crisis, the submarine can contribute to the defensive ASW posture protecting vital maritime assets from ASW threats.

ASUW Similar to the ASW task, the submarine can perform ASUW both as an independent actor or jointly. In the role of offense suppression, the submarine would locate and destroy surface platforms that pose the greatest threats to follow-on forces, such as cruise missile platforms. In the joint role, the submarine would contribute to defense of fleet assets by monitoring movements and preventing enemy surface forces from leaving port.

Strike Warfare Though primarily an offensive oriented task, the submarine can use strike warfare for both offensive and defensive purposes. As an independent actor conducting offense suppression for follow-on forces, the submarine can use precision strikes against ground-based surface to surface missile sites, such as the *Silkworm*, and against coastal and inland airfields. Acting in a joint role, the cruise missile carrying submarine can provide defense suppression for land- and sea-based air strikes, and can participate in integrated strike operations.

Mine Warfare The submarine's unique capabilities provide the joint force commander in a regional contingency with the ability to dominate this often neglected facet of naval warfare. The traditional mine warfare mission of the submarine concerns use of the submarine's stealth to allow it to deploy mines for offensive purposes. This traditional capability will primarily be used in the initial offense suppression operations of an independent forward operating submarine. Mine warfare can be used against surface or submarine threats to keep combatants from leaving port or transiting a choke point, or can be used to enforce a blockade or embargo.

An unexplored and potentially more important mission of the submarine in mine warfare lies in the ability of the submarine to provide an aggressive means of defending against hostile mine warfare forces. The US Navy's experience in the Persian Gulf over the last ten years provides sufficent evidence of the impact of relatively simple mine warfare capability on maritime operations. So far the emphasis in combatting mine warfare has been on locating and neutralizing or avoiding minefields. The utility of the submarine in mine warfare is its ability to covertly identify, monitor, and, if necessary, destroy hostile minelaying craft prior to the laying of significant numbers of mines. This *anti-mining* mission is a fundamentally new direction for submarines and the US Navy and will become more important in future regional contingencies.

Special Warfare The submarine's ability to operate covertly in hostile waters makes it an ideal platform for support of special warfare operations. "Submarines allow small groups of special-operations forces to be inserted with the elements of surprise and secrecy essential to their missions."[27] These operations can be conducted at any time during a conflict.[28]

Ocean Surveillance and Intelligence The submarine's unique characteristics of stealth and agility allow it to perform these supporting tasks while retaining the key strategic elements of surprise and initiative for the operational commander. In a situation of crisis response, submarines can be used to shadow potential naval threats before hostilities escalate without the fear of provoking a preemptive response. The intelligence capabilities of the submarine can be used

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[27]Vice Admiral Roger F. Bacon, "Submarine Warfare - It's A-Changing," *US Naval Institute Proceedings*, June 1992, 53.

[28]For further discussion of the submarine's role in special warfare see John L. Byron, "A New Target for the Submarine Force," *US Naval Institute Proceedings*, January 1990, 37-39.

throughout a conflict to support amphibious or ground operations, anti-mining operations, as well as to gather real-time tactical and strategic intelligence information.

1. Rapid Response and Offense Suppression

The most important role that submarines play in crisis response is that of rapid response and offense suppression. The submarine is the ideal platform for this role due to its stealth. Its ability to remain undetected allows it to be inserted into a hostile region without the need for significant defensive support. The ability of submarines to perform offense suppression of sea and land based threats performs two functions for the operational commander. First, it reduces the threat to follow-on forces by destruction or degradation of the adversary's capabilities. Second, it forces the adversary to divert his forces from operations against follow-on forces to operations to neutralize the submarine threat. The submarine's unique capabilities also provide the operational commander with real-time covert intelligence that could prove invaluable to coordination and defense of follow-on forces.

2. Joint Task Force Support and Ground Warfare Support

In joint operations, the submarine can simultaneously support both defensive and offensive tasks as designated by the operational commander. The fundamental tasks that the submarine can perform in crisis response include ASW, ASUW, Strike, and Mine Warfare as well as the supporting tasks of Special Warfare, Ocean Surveillance, Combat Search and Rescue (CSAR), and Intelligence. The submarine's role in joint task force and ground warfare support is complementary in nature. The submarine can be tasked with missions from either the joint force commander or commander in chief (CINC), or the local

Battle Group or Naval Expeditionary Force commander. The operational commander can use the submarine for a variety of missions in support of ground or amphibious forces or for insertion, extraction, or support of special forces. The Naval Expeditionary Force commander can use the submarine for support of maritime forces in the area. In both cases, this support would occur in situations where follow-on forces have arrived and established themselves in the region. Additionally, the submarine will continue its offense suppression efforts, using its ability to operate far forward.

3. Integrated Strike Operations

The ability of the submarine to employ cruise missiles provides the operational commander with additional flexibility and strike capability.

> Submarines will not replace traditional carrier aircraft heavy-strike ordnance, but submarine-launched cruise missiles could be the vanguard element that attacks air-defense, early-warning, and communications facilities to reduce the threat against follow-on aircraft. . . Just as important, the submarine can exploit the element of surprise by launching the attack along an undefended axis.[29]

This is especially true for the improved *Los Angeles* class or SSN-688I class submarines that carry twelve external vertical launch cells for carrying cruise missiles in addition to those carried internally on all other submarines. The effectiveness of the *Tomahawk* missile was ably demonstrated during Operation Desert Storm.[30]

In summary, these three roles, of rapid response and offense suppression, task force and ground support, and integrated strike operations, demonstrate

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[29]Vice Admiral Roger F. Bacon, "Submarine Warfare - It's A-Changing," *US Naval Institute Proceedings*, June 1992, 53.

[30]See Donald C. Daniel, *Beyond the 600-Ship Navy*. Adelphi Paper 261 (London: Brassey's for International Institute of Strategic Studies, 1991), 29.

that the submarine is an important contributor to the national objective of crisis response. As with the submarine roles that support forward presence, these roles are not dependent upon the threat of Russian naval forces.

E. NUCLEAR DETERRENCE AND STRATEGIC DEFENSE

The National Security Strategy of the United States divides its discussion of deterrence into strategic and non-strategic forces.[31] Strategic forces deal with strategic deterrence, strategic defense, and national technical means of verification, while the non-strategic forces deal with regional deterrence of weapons of mass destruction. Strategic forces appear to be declining in importance, while concern over regional deterrence is growing.

1. Strategic Deterrence

The instruments for maintaining strategic deterrence were developed as integral parts of the Cold War. The primary differences between the force structures supporting strategic deterrence in the new era from force structures of the Cold War are size and defenses. The Strategic Arms Reduction Treaty (START) as well as the unilateral initiatives of the United States and the republics of the former Soviet Union have led to real reductions in on-alert nuclear weapons by both superpowers. As the United States has taken its bomber force off alert and deactivated half of its intercontinental ballistic missile (ICBM) force in preparation for dismantling,[32] the sea-based leg of the strategic triad has assumed more responsibility. Precisely because of its unique characteristics, the

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[31]See *National Security Strategy of the United States*, 25-27.

[32]For further details, see Department of Defense, "Department of Defense News Briefing with Secretary of Defense Dick Cheney, General Colin Powell, Chairman, JCS, Pete Williams, ASD (Public Affairs) Saturday, September 28, 1991," which followed the President's nuclear initiative address on national television.

SSBN continues to provide the United States with a powerful invulnerable weapon system capable of deterring nuclear attack.[33]

2. Strategic Defense

a. Strategic ASW

A less publicized facet of nuclear deterrence is the role played by the US attack submarine.[34] The ability of the submarine to conduct forward ASW allows it to hold opposing SSBNs at risk. This was a key element in NATO's Maritime Strategy. Critics of strategic ASW in the past claimed that destroying Soviet SSBNs during the conventional phase of the conflict would seriously affect crisis stability by forcing the Soviet Union to escalate to nuclear war or risk losing some of its sea-based nuclear weapons. Proponents of strategic ASW claimed that the destruction of SSBNs would not be enough incentive to force the Soviets to escalate to general nuclear war. At best, the loss of SSBNs would sufficiently change the nuclear correlation of forces to provide NATO with escalation

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[33]Ibid., 7. The Government Accounting Office has released the preliminary findings of its report on the strategic triad, this report notes the significant strengths of the SSBN as compared to the other members of the triad, see "GAO Attacks Assumptions on Strategic Forces, Finds Little Reason for B-2, ICBMs," *Inside The Navy*, 5 October 1992, 1. Also for further discussions see *Submarine Roles in the 1990's and Beyond*, 11; Richard T. Ackley, *Trident SSBNs in START* (Monterey, CA: Naval Postgraduate School, 1990), Technical Report NPS-56-90-008; and Richard L. Garwin, "Will Strategic Submarines Be Vulnerable?" *Naval Strategy and National Security* (Princeton: Princeton University Press, 1988), 222-237.

[34]For discussions of strategic ASW, see Garwin, "Will Strategic Submarines Be Vulnerable?"; Tom Stefanick, *Strategic Antisubmarine Warfare and Naval Strategy* (Lexington, MA and Toronto: Lexington Books, 1987); and Donald C. Daniel, *Anti-submarine Warfare and Superpower Strategic Stability* (Urbana and Chicago, IL: University of Illinois Press, 1986). The issue of strategic ASW was a common topic for articles and discussion in *Naval Institute Proceedings*, for examples see: John L. Byron, "No Quarter for Their Boomers," April 1989, 49-52; Michael N. Pocalyko, "Sinking Soviet SSBNs," October 1987, 24-36; Richard T. Ackley, "No Bastions for the Bear: Round 2," April 1985, 42-47; and James J. Tritten, "Strategic ASW: A Good Idea?" January 1984, 90-92.

dominance and force the Soviets to terminate the conflict on terms favorable to the Alliance.

The strategic situation the United States faces today and in the future will be fundamentally different from the one it faced during the Cold War. With START reductions, along with the proposed unilateral reductions of Ukraine, Belarus, and Kazakhstan, the proportion of warheads carried by Russian SSBNs will initially become more significant. If the United States and Russia follow through on their agreement to de-MIRV[35] land-based ICBMs, then sea-based warheads will comprise the majority of former Soviet nuclear weapons. With these trends, the situation of Mutual Assured Destruction (MAD) will become less certain and the role of the attack submarine in true damage limitation through strategic ASW will become more significant.[36] The converse side of this logic is that Russia, faced with declining numbers of nuclear warheads may choose to remove all of its nuclear warheads from submarines and base its strategic forces solely on land. If this is the case, then the need for submarines to fulfill the role of strategic ASW will obviously disappear.

An argument against strategic ASW is that the possibility of a nuclear exchange is so remote, that it is does not justify maintaining submarines for that express purpose. Indeed, this points out the difference between

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[35]MIRV refers to Multiple Independent Reentry Vehicles.

[36]There is by no means a consensus on the effect of MAD on strategic nuclear deterrence let alone MAD's precise definition. For the purposes of this thesis MAD is defined to be a *situation* where two opponents possess the capability to destroy the other but are unable to prevent their own destruction. There is an opposing view of MAD as a distinct *policy* of both actors, however this paper does not use that definition. For a more complete discussion of MAD and its affect on the superpower relationship see, Rhodes, *Power and MADness: The Logic of Nuclear Coercion* ; and Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon.*

programming and war planning. The submarine force can ill afford to justify its existence solely on the remote possibility of nuclear war. Thus, for programming purposes, submarine force structure determinations should not be based on this role. At the same time, however, the consequences of nuclear war are so immense, that for war planning purposes and for design requirements for future submarines, the role of strategic ASW cannot be ignored.[37]

b. GPALS

An additional future role for the submarine force in strategic defense concerns the possibility of using the submarine as a platform for the Global Protection Against Limited Strikes (GPALS) system for Anti-Ballistic Missile (ABM) defense. As US strategy shifts from global defense to regional defense, the submarine must also be considered as a possible platform for Anti-Tactical Ballistic Missile (ATBM) defense as well. The submarine could prove to be an ideal platform for weapons designed to intercept ballistic missiles in their initial boost stages of flight. The characteristics of stealth, endurance, and agility all make the submarine the ideal platform for this mission.

3. National Technical Means of Verification

Arms control is another role of the submarine related to strategic nuclear deterrence. With START in the process of being implemented, and with the numerous unilateral initiatives, the submarine provides the United States with an

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[37]See James J Tritten, "Address to the Submarine Technology Symposium, 12 May 1992," *The Submarine Review* (July 1992), 26; or "Chairman's Remarks and Paper - The Submarine's Role in Future Naval Warfare," in *Proceedings of the Fifth Submarine Technology Symposium (U), 12-14 May 1992*, by the Naval Submarine League and Johns Hopkins University - Applied Physics Laboratory (Laurel, MD: Johns Hopkins University - Applied Physics Laboratory, 1992), 45-60, JHU/APL STD-R-2121.

irreplaceable national technical means (NTM) of verification.[38] This is not to say that the submarine is the primary NTM of verification. Its role is complementary, providing data and information unavailable through other means. As with the capability to conduct strategic ASW, the United States must continue to use its submarines for verification as long as potential adversaries retain SSBNs and as long as there are treaties or agreements governing these weapons.

4. Regional Deterrence of Weapons of Mass Destruction

President Bush pushed the subject of non-strategic nuclear forces into the shadows with his nuclear initiative of September 27, 1991.[39] This initiative eliminated or removed to storage much of the US non-strategic nuclear arsenal. Included in this initiative was the nuclear variant of the Tomahawk land attack missile (TLAM-N). This initiative was "intended to enhance our security through arms reductions while preserving the capability to regenerate selected forces if required."[40] In this new world order, with the prospect of Third World countries developing and using weapons of mass destruction against our national interests or against the United States, the TLAM-N carried on a submarine could offer the leverage necessary to provide or strengthen regional nuclear deterrence in the future. The submarine carrying TLAM-Ns provides advantages to regional nuclear deterrence which other possible platforms do not. By being able to remain undetected, the submarine strengthens crisis stability by eliminating any advantage gained by preemption. The submarine's ability to

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[38] *Submarine Roles in the 1990's and Beyond*, 12-13.

[39] See Department of Defense News Briefing of September 28, 1991.

[40] *National Military Strategy 1992*, 13.

operate independently, remain on station for extended periods, and deploy quickly to crisis areas, gives it a decided advantage over other eligible platforms. Surface naval and air forces capable of employing nuclear weapons require substantially more support forces to ensure sustainability and self-defense. Furthermore, surface and air forces provide more incentive for preemption, thus weakening crisis stability by being more vulnerable to detection and attack. To fill this role, the submarine force must retain the capability to handle and employ the TLAM-N weapon system. The incentives for eliminating that capability are compelling in the short term, but the submarine's contributions to future regional nuclear deterrence outweigh any possible short term gains.

To summarize, the submarine force has played a major role in nuclear deterrence, and that role appears to be growing. With the recent agreements on nuclear weapons between the United States and Russia, the importance of the SSBN is growing. Additionally, the role of the submarine in strategic ASW has not yet changed nor has its value as a national technical means of verification. One role that the submarine has played in the past appears to be changing. That role involves the ability to employ the TLAM-N, which was previously designed for use against the former Soviet Union but now appears to be well suited to regional conflicts involving weapons of mass destruction. The submarine carrying the TLAM-N is well suited to the task of strengthening non-strategic nuclear deterrence in regional crises. The submarine's roles in supporting nuclear deterrence are very similar to its roles during the Cold War. With the exception of the regional nuclear deterrence mission, they are still largely dependent upon the naval forces of Russia and require the use of the nuclear submarine as an independent actor. As the capability of the naval forces of

Russia continues to decline, the number of US submarines that are necessary to fill this role will decline as well. Much of US submarine force levels based upon this role are dependent upon the outcome of verifiable bilateral and unilateral decisions concerning nuclear warhead numbers and deployment methods.

F. RECONSTITUTION

The nuclear submarine, due to the time required for its construction, is ill-suited for consideration as a reconstitutable asset.[41] Yet, the submarine still plays a number of roles in the concept of reconstitution. These roles involve deterring the emergence of a competing naval power through the maintenance of a submarine industrial base and the maintenance of undersea superiority, and providing warning time to the United States of the emergence or reemergence of a global threat that would require the reconstitution of forces.

1. Deterrence of Emergent Global Threat

a. Maintenance of Submarine Industrial Base

Included in the concept of reconstitution is the maintenance of an adequate industrial base. With the number of submarine shipyards reduced to two and with the cancellation of the *Seawolf* program, maintenance of a submarine industrial base is a current and vital issue. The two submarine shipyards will finish building 688-class submarines by 1996 or 1997. Serious decisions must be made soon concerning the submarine industrial base. This "mission" has rapidly become the most important issue for the submarine force today.

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[41]Vice Admiral Roger F. Bacon, "Submarine Warfare - It's A-Changing," *US Naval Institute Proceedings*, June 1992, 54; "It takes 12 years to design and build a nuclear attack submarine."

b. Maintenance of Undersea Superiority

In addition to maintaining an industrial base, the United States must maintain its undersea advantage and thus make it too costly for any potential enemy to consider building a capable submarine force. The world has seen two ruthlessly successful submarine campaigns conducted this century alone. It can ill afford to witness another.

2. Threat Identification

The submarine's ability to conduct ocean surveillance and to collect intelligence will contribute to this nation's ability to guarantee adequate warning time to allow for the ability to "reconstitute a credible defense faster than any potential opponent can generate an overwhelming offense."[42] This role is decidedly small in the overall context of strategic warning, however it provides information that may be unobtainable through other sources.

In summary, these two roles demonstrate that despite its inability to be reconstituted, the submarine is still a factor in the national objective of reconstitution. The primary goal of reconstitution is to deter an emergent global threat. By maintaining a viable submarine industrial base and maintaining our technological achievements in undersea superiority, the submarine becomes a significant contributor to this goal. If deterrence fails, the submarine will be one of the means of verifying the existence of an emergent global threat. It is important to note that this role has little to do with the former Soviet Union as it exists today. Rather, this role deals primarily with the future opponents of the United States. Whether or not they emerge from the remains of the Soviet Union is irrelevant.

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[42]*National Security Strategy of the United States*, 30.

G. CONCLUSIONS

This discussion of roles and missions for US submarines is important for a number of reasons. First, it demonstrates that the notion of the submarine as solely a Cold War weapons system is clearly flawed. The submarine is a very effective weapons system for regional warfare as well. In fact, with the exception of the national objective of nuclear deterrence and defense, the submarine roles and missions just discussed relate to the more likely possibility of regional conflicts and crises, along with the possible emergence of a global threat in the future. Second, the submarine is clearly not solely an ASW platform. Even during the Cold War, the submarine was designed and developed to have multimission capability. This capability is needed now more than ever in not only the submarine force but in all US weapons systems. Those opponents of submarines as single mission weapons platforms are correct in stating that we cannot afford to field weapons that are unidimensional, however, they are incorrect to infer that the submarine is unidimensional.

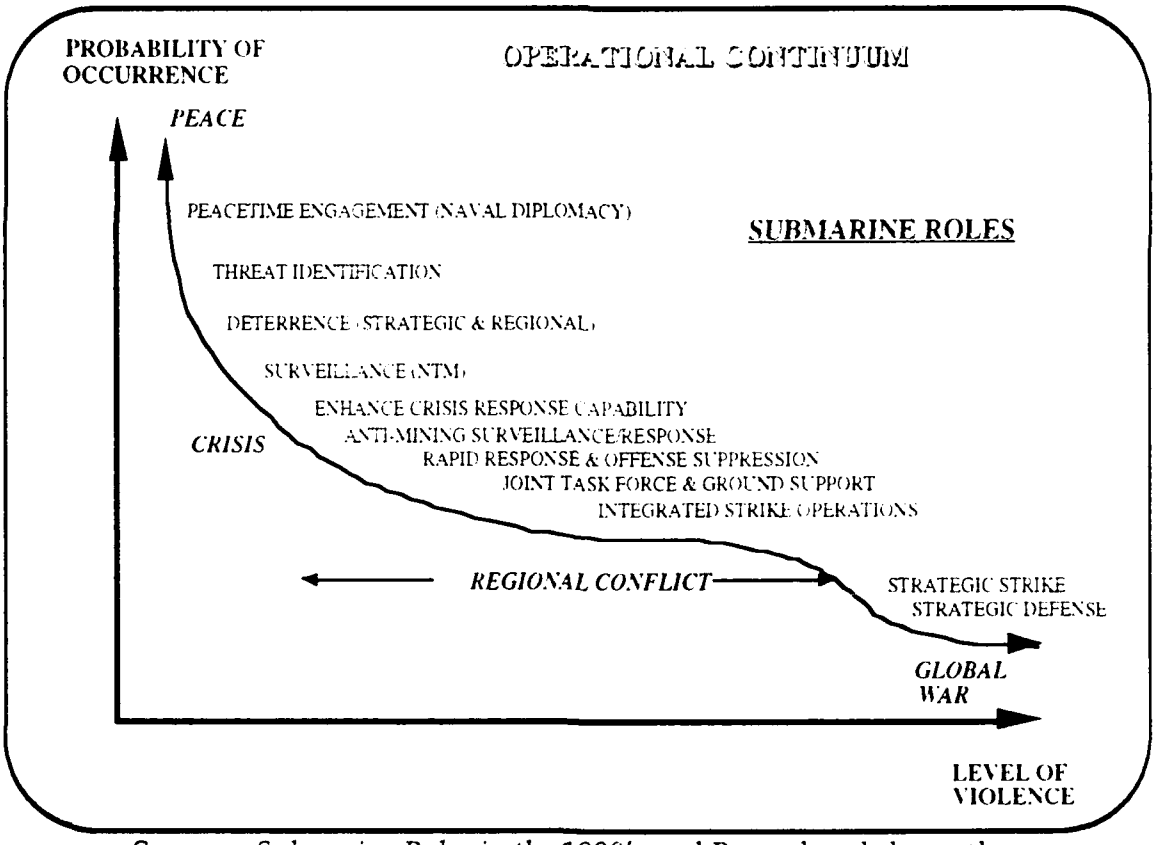
Clearly, this discussion is not meant to portray the submarine as the ultimate weapon system for the new world order. Instead, the purpose of the presentation is to outline the multiple and various means in which the submarine can *contribute* in this new international security environment. The submarine's unique characteristics of stealth, endurance, and agility as well as its multimission capabilities make it an important contributor to forward presence, crisis response, deterrence, and reconstitution. Table 1 summarizes these contributions below.

TABLE 1. SUMMARY OF SUBMARINE ROLES AND MISSIONS

NATIONAL OBJECTIVE	THE SUBMARINE'S ROLE	RELATED TASKS AND/OR MISSIONS
NUCLEAR DETERRENCE and STRATEGIC DEFENSE	Strategic Nuclear Deterrence (SSBNs)	Strike Warfare against former Soviet Union using SLBMs
	Strategic Defense	ASW against SSBNs (Strategic ASW) Ocean Surveillance of SSBNs GPALS
	National Technical Means of Verification	Ocean Surveillance and Intelligence Collection to verify nuclear arms control agreements
	Regional Deterrence of Weapons of Mass Destruction	Strike Warfare against regional nuclear states using TLAM-N
FORWARD PRESENCE	Peacetime Engagement (Naval Diplomacy)	Forward Deployments and Exercises Multinational Exercises Port Visits
	Enhance Crisis Response Capability	Forward Deployments and Exercises Ocean Surveillance Intelligence Collection
CRISIS RESPONSE	Rapid Response & Offense Suppression	Anti-Submarine Warfare Anti-Surface Warfare Strike Warfare against missile facilities and airfields Mine and Anti-Mine Warfare Intelligence Collection Special Warfare
	Joint Task Force Support & Ground Support	Anti-Submarine Warfare Anti-Surface Warfare Mine and Anti-Mine Warfare Intelligence Collection Special Warfare CSAR
	Integrated Strike Operations	Strike Warfare J-SEAD
RECONSTITUTION	Deter Global Threat	Maintain Industrial Base Maintain Submarine Superiority
	Threat Identification	Intelligence Collection Ocean Surveillance

In looking at these roles and missions for the submarine, one should realize that the heirarchy of the four "pillars" is in a state of transition. During the Cold War, nuclear deterrence and forward presence were the high priorities.[43] Now, with the focus on regional warfare, forward presence and crisis response are becoming the highest priorities. Figure 2 illustrates the new emphasis for submarine roles. As the emphasis for roles and missions changes, this requires a reevaluation of submarine force structure and submarine design. This ensures that they are still supporting the main focus of submarine operations.

Figure 2. Submarine Roles In The Operational Continuum



Source: *Submarine Roles in the 1990's and Beyond* and the author

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[43]See Admiral Carlisle A. H. Trost, "Looking Beyond the Maritime Strategy," *US Naval Institute Proceedings*, January 1987, 14.

III. FORCE STRUCTURE

A. INTRODUCTION

In this period of defense drawdowns, the issue of force structure in the military is becoming the focal point for competition for a share of the shrinking federal budgetary pie. The purpose of this chapter is *not* to become involved in parochial issues concerning force size or comparative benefits of particular weapons systems.[1] Instead, this chapter will attempt to address objectively certain issues related to force structure in order to clearly define the boundaries of the ongoing debate. The term force structure in this chapter refers not only to force size, but also includes the means for utilization of existing assets.

B. FORCE SIZE

Submarine force size is becoming the subject of considerable debate today. Contributing factors in this debate are the cancellation of the *Seawolf* submarine, perceptions that the submarine is obsolete and unsuited to the new world order, and desires to reap a "peace dividend" from increased defense cuts. The purpose of this section is to address both the short and long term issues that will affect the force size of the submarine force in the post-Cold War era. This section assumes that, indeed, there is a role for the submarine in the post-Cold War world.

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[1] A recent study of the Joint Staff on the submarine's relationship to the National Military Strategy concluded, "The panel found the current articulation of national strategy neither sufficiently specific to shape force structure decisions, nor cast in sufficiently palatable/strong terms to justify resource requirements." See Department of Defense, Joint Staff, Deputy Director for Assessment/J8, "Final Report," *Potent Striker I* (Washington, D.C.: US Department of Defense, 1992), 2.

If force size were set entirely by the Department of Defense, in a period of unlimited resources and objective mindsets, then submarine force levels would be based upon requirements determined by the Navy and the unified Commanders in Chief (CINCs). These force levels would be based upon perceived threats and force packages deemed necessary to meet operational requirements to meet those threats. Given that the resources of the Department of Defense are finite, then decisions must be made to match resources to requirements in the most efficient way possible. These decisions are made by the Joint Chiefs of Staff (JCS), the Chairman of the JCS, the Secretary of Defense, and their staffs, and the guidelines are set by the Defense Planning Guidance (DPG) These decisions are simply an input into the overall federal budgetary process. Overall force structure will be affected further by resource allocations set by the Office of Management and Budget (OMB) and finally set by the Congress into law during the annual defense authorizations and appropriations process.[2]

Given this process for force size determination, what are the critical factors that have changed that will affect the ultimate size of the submarine force? The most obvious, as discussed in the Introduction, is the end of the Cold War. According to the *New York Times*, this has drastically changed the DPG with its perception of the threat and possible warfighting scenarios.[3] The resulting submarine requirements as established by the Navy and the unified CINCs will undoubtedly be reduced with the reduced threat. The end of the Cold War has

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[2]For a better description of this process, see Frederick Hartmann and Robert Wendzel, "The Defense Resource Allocation Process," in *Defending America's Security* (New York: Brassey's, 1991).

[3]See "Pentagon Imagines New Enemies to Fight in Post-Cold War Era: Plans for Hypothetical Conflicts and Big Budgets," *New York Times*, 17 February 1992, p. 1(A).

also put a further demand on resources. With the reduced threat, both the Executive and Legislative branches of the government have reduced the budget for overall defense expenditures. This reduction will certainly reduce the force size of the submarine force, but also will increase friction between competing communities within the Navy and between the individual services for scarce resources. These changes affecting the requirements process have both short-term and long-term implications for submarine force size. The short-term implications involve the transition from a Cold War submarine force size to a regional defense submarine force size. The long-term implications involve the ultimate size of the submarine force in the post-Cold War world.

1. Short Term Factors, The "Glide Slope" of Submarine Reductions

In looking at the short-term implications on submarine force size, one must realize that virtually all involved in the process agree that the submarine force of the future will be smaller than it was during the Cold War. The issues in the debate involve the transition from a Cold War force size of over 90 submarines to a post-Cold War force size of indeterminate number. There have been numerous attempts to place a number on submarine force size, including the Base Force level of the Administration of 80 SSNs, and the varying force packages of Representative Les Aspin, chairman of the House Armed Services Committee, which have postulated force levels of 20 to 50 SSNs.[4] There are currently 84 submarines in the force with 14 submarines of the improved SSN 688 class still under construction. *Seawolf* class submarine production has certainly been canceled, however, the final number to be produced, whether it is one, two, or

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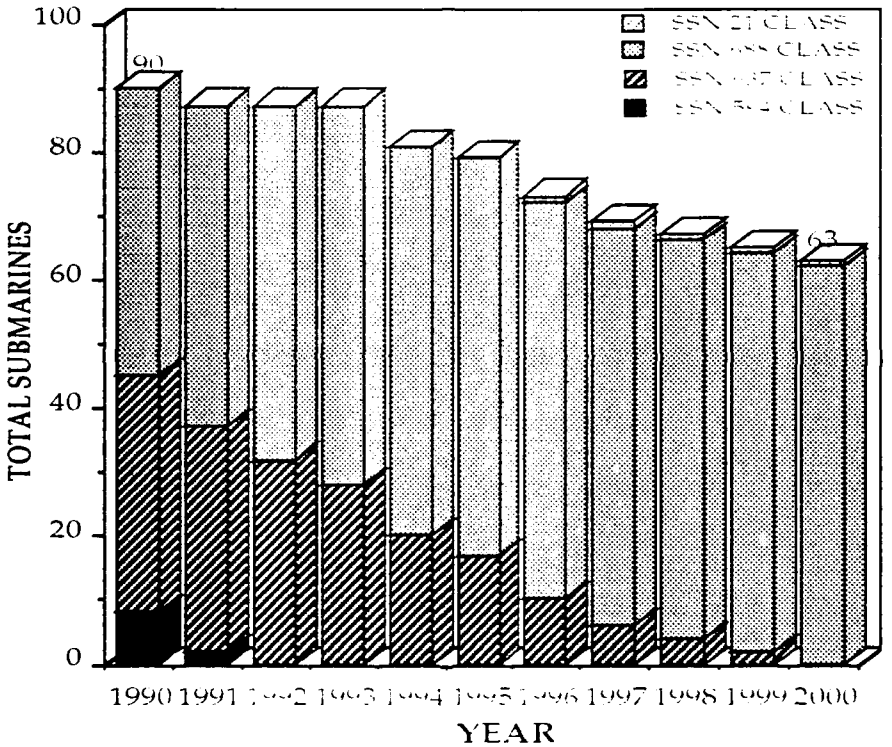
[4]See Representative Les Aspin, *An Approach to Sizing American Conventional Forces For the Post-Soviet Era: Four Illustrative Options* (Washington, D.C.: US Congress, 25 February 1992), Chart II.

three, has yet to be ironed out. Figure 3 shows the postulated submarine force structure using nominal service lives of the pre-SSN 688 class submarines of 25 years and the assumed construction of the SSN 21 class submarine. The service life of 25 years is nominal due to the fact that some submarines have been either extended in life or retired early due to considerations about the remainder of nuclear fuel remaining or for budgetary reasons.

Figure 3. Submarine Force Levels



Source: Bernard Prezelin, *Combat Fleets of the World 1990/1991* (Annapolis: Naval Institute Press, 1991)

(Retirements based on nominal service life of 25 years for 594- and 637-class SSNs)

The factors affecting the short term size of the submarine force are those that are dominating the defense debates today. While there is consensus that the United States can reduce its defense forces, there is little agreement on the proper path to do so. There are those who desire to cut defense expenditures as rapidly

and drastically as possible so as to reap a "peace dividend." On the other hand, there are those who would cite the historical lessons of rapid US defense drawdowns and their unfortunate circumstances to promote a controlled and sensible drawdown.[5] What then are the primary factors that will affect the glide slope of submarine force levels?

The factors that appear to be developing that will affect submarine force levels are primarily related to economics with a few exceptions. It is interesting to note that despite numerous projections that the defense budget would be slashed following the demise of the Soviet Union in December 1991, the defense budget remained largely intact with minor reductions. The primary factors behind this appear to be related to the economy. Many lawmakers were concerned that rapid and steep defense cuts would have significant effect on employment, and further weaken an already stagnant economy. Thus, the primary justification for holding the line on defense cuts was not related to defense but to electoral concerns related to economics.[6]

The best example of this is the "full court press" exerted by New England lawmakers to reinstate the second and third Seawolf submarines following President Bush's proposed rescission.[7] The common reasons cited for maintaining these ships were not related to the military application of these

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[5]See Admiral David E. Jeremiah, "Beyond the Cold War," *US Naval Institute Proceedings*, May 1992, 52-57.

[6]For a discussion of Congressional concerns over defense cuts, see Pat Towell, "As Bush Budget Nears Release, Lawmakers Dig In for Fight," *Congressional Quarterly: Weekly Report*, 11 January 1992, 56.

[7]See Pamela Fessler, "The *Seawolf's* Ups and Downs," *Congressional Quarterly: Weekly Report*, 21 March 1992, 737; and Fessler, "Members Lobby Hard To Protect Endangered Submarine Project," *Congressional Quarterly: Weekly Report*, 25 January 1992, 177.

submarines, but rather the adverse effects these cancellations would have on the economies of the affected states, primarily Connecticut and Rhode Island. A related issue is the viability of the submarine industrial base. This issue encompasses both economic and defense concerns.[8] The concern is that if submarines are not produced for a number of years, the United States will lose the ability to produce nuclear submarines without a significant expenditure of resources to revitalize the industry. This issue, though extremely important, will not significantly affect the glide slope of submarine force reductions. This is due to the fact that it involves the production of approximately one ship per year.[9] This is not significant in the short term, given the current numbers of submarines. In the long term, however, it will become a major issue.

Another economic issue that will affect the glide slope of submarine force reductions is that of the costs related to retiring submarines. The major costs associated with submarines are those related to construction, refueling, and retiring. The annual operating costs, or those related to normal operation of the submarine, are small compared to other non-nuclear ships.[10] Thus, it costs significantly more to retire a submarine than to operate it. This reality provides a

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[8]For further discussion of Congressional motivations, see Paul N. Stockton, "The Congressional Response," in *Reconstituting America's Defense: The New U.S. National Security Strategy*, ed. James J. Tritten and Paul N. Stockton (New York: Praeger Publishers, 1992), 81-83.

[9]See "The Reuter Transcript Report: Retired Admiral Carlisle Trost, Former Chief of Naval Operations and Current Chairman of the Naval Submarine League. National Press Club Newsmaker Address," 24 April 1992, 5. Admiral Trost discussed the need to build the second and third *Seawolf* submarines, saying, "My point is to build those first three *Seawolfs* in order to preserve an industrial base . . ."

[10]Department of the Navy, Assistant Chief of Naval Operations (Undersea Warfare), *Submarine Roles in the 1990's and Beyond* ([Washington, D.C.]: US Department of the Navy, 1992), 20. "The annual operating cost of an attack submarine is about one-half that of a destroyer or frigate and only one-third that of a cruiser."

dilemma to those seeking short term benefits from the defense cuts: *in order to achieve defense cuts, one must actually spend more money in the short term.* One proposed solution to this is to tie up submarines at the pier and man them only with skeleton crews until they can be decommissioned at a reasonable rate in later years. This would provide some immediate savings in terms of decreased life-cycle costs, however, it is simply delaying the inevitable costs associated with retiring the submarine. Another similar option would be to "mothball" nuclear submarines, similar to what has been done to battleships. This option has never been utilized for nuclear powered vessels in the past. It appears that any effort to "mothball" a submarine would have the same costs associated with it than the costs associated with scrapping the submarine. Thus, no budgetary incentives exists to pursue this option. These economic constraints may be the most important factors in determining the glide slope as the submarine force prepares to decommission 35 submarines in the next five or six years.[11]

The last factor that may affect the glide slope of submarine reductions in the short term is the uncertainty of the international environment. This relates to the argument that the United States should learn from its mistakes in its rapid and precipitous defense drawdowns following previous wars. Given that the international system has yet to stabilize itself following the end of the Cold War, it is perhaps prudent to reduce our forces cautiously until we have a better understanding of the new world around us.

If one were to look at the results of the defense debates in 1992, the first full year after the end of the Cold War, one could draw the hasty conclusion that the

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[11]See Vice Admiral Roger Bacon, "Q & A with Vice Adm. Roger Bacon," interview by Richard Lawson, *Inside The Navy*, 24 August 1992: 6. "We have inactivated 26 submarines. Another 35 are scheduled to be inactivated in the next five or six years."

voices of reason and caution had won the day. It is important to realize that this year is one of exceptions rather than the rule. First, and most importantly, this is a political election year that is clearly emphasizing economic concerns over international concerns for the first time since World War II. As a result, many defense questions have been decided solely on their economic merits vice any concern over defense issues. Second, this is the last year of a budget agreement between the President and Congress that provides a specific allotment of discretionary funds to defense that can not be transferred to domestic spending. This agreement thus removes any incentive, except decreasing the budget deficit, to cut defense funds significantly. The true rate of descent of submarine force levels will be determined by the actions of Congress in 1993.[12] The factors affecting that debate will be, once again, primarily economic nowever the constraints of the debate during 1992 will no longer exist.

2. Long Term Factors, The Ultimate Size of the Regional Defense Submarine Force

While the short term issues concerning submarine force levels affect primarily the rate or glide slope of submarine reductions, the long term issues will affect the ultimate force levels themselves. The primary factors can once again be divided into economic and defense related issues. These concern the submarine industrial base, the allocation of scarce resources both within the federal government and within the Department of Defense, and the determination of requirements by the unified CINCs and the Navy.

Assuming that the submarine has a place in the post-Cold War defense establishment, the submarine industrial base may become the deciding factor for

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[12]See Scott C. Truver, "Tomorrow's Fleet: Part I," *US Naval Institute Proceedings*, June 1992, 50.

submarine force levels. Indications of the concern over this issue are evident in the debate over the second and third Seawolf submarines.[13] As a result of this concern, the Navy has begun a study of the industrial base problem to determine the effect of current programs and cancellations. This study will certainly have an effect on the decision of when to start production of the next generation submarine, tentatively named *Centurion*.[14] It will also probably set the baseline production number of submarines to ensure the viability of the industrial base.[15] The issue of whether to support one or two submarine shipyards will affect this baseline. It seems obvious that a baseline to support two shipyards will be larger than a baseline that supports only one. This baseline will be important for long term submarine force levels. It will provide a concrete *floor* for submarine force levels that cannot be broken as long as the submarine is considered a vital weapons system for the United States. This reality can have both positive and negative implications. In a positive sense, it provides the Navy and the unified CINCs with a stable minimum for force package planning. In a negative sense, the establishment of a set number may in fact become a definitive *ceiling* to a Congress that is bent on achieving defense savings. Regardless of the

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[13]In addition to Fessler, "The *Seawolfs* Ups and Downs," and "Members Lobby Hard To Protect Endangered Submarine Project," see Congress, Senate, *National Defense Authorization Act for Fiscal Year 1993*, 102nd Cong., 2nd sess., Report to accompany S. 3114, 31 July 1992, 39. This Report contains a section on the submarine industrial base outlining specific concerns and mandating an annual report on the status of the industrial base.

[14]See "Q & A with Vice Adm. Roger Bacon," 6. "But until we put an end point in the industrial base gap, *which is the authorization of the next new-design submarine, the Centurion project*, what happens in the industrial base for submarine nuclear production? That is the real issue. (emphasis added)."

[15]See "Industrial Base Study Expected To Call For A 60 Boat Attack Sub Fleet," *Inside The Navy*, 27 July 1992, 9.

implications, the submarine industrial base will have a significant impact on long term submarine force levels.

Budgetary issues will certainly have an impact on submarine force levels. On the level of the federal government as a whole, the problem of persistent budget deficits will continue to force both the executive and legislative branches to seek ways to reduce spending. The fact that defense expenditures must be budgeted on an annual basis makes the defense budget an easy target for "quick fixes" to budgetary problems. Within the Department of Defense, there is an increasing competition for a share of the shrinking budgetary pie.[16] This is resulting in a comprehensive review of roles and missions for the services, with the goal of eliminating redundancy in order to achieve budgetary savings. Thus, the combined effects of a decreasing allocation of total funds, and the consolidation of roles and missions in order to meet demands with a smaller force will tend to be a limiting factor in determining submarine force levels.

The determination of requirements by the Navy and the unified CINCs will set a number that will in all likelihood be the *ceiling* for submarine force levels. This statement is based on the assumption that a distinct, global threat does not emerge in the near future that will force a reevaluation of US defense posture. Given the absence of a large global threat, it is inconceivable that Congress will overrule the military's judgment in favor of larger defense expenditures on submarines. This is already evident in the current defense debates. The Administration, in its *National Security Strategy of the United States*, and the Chairman of the JCS, in his *National Military Strategy*, outlined what is referred to

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[16]See for an example of this, Vice Admiral Owens' discussion of the budgetary tradeoffs that may be necessary in the future, "Owens: Carrier Level doesn't have to Drop if Budget Continues to Drop," *Inside The Navy*, 5 October 1992, 3.

as the Base Force for the military, which implies a *floor* for proposed defense cuts. Congress has instead taken these figures and made them, in effect, *ceilings* for their debates on defense expenditures.[17] Barring any emergent global threat, this trend of the military providing defense force level *ceilings* can be expected to continue.[18]

To summarize, there appear to be three main factors that will affect the ultimate levels of the submarine force in the long term. Perhaps the most important of these is the submarine industrial base. Ongoing studies of this issue should determine a baseline below which submarine procurement cannot fall without affecting the viability of the industrial base. Thus, this factor should set a concrete *floor* for submarine force levels. Note that this floor will be affected by the decision as to maintain one or two submarine shipyards. This decision will be a very contentious political issue. A limiting factor in long term submarine force levels will be the impact of declining resources on both the federal budget and the defense budget. Efforts to contain a persistent budget deficit, and consolidation of roles and missions to reduce inter-service redundancy may contribute to *limiting* submarine force levels. The final factor affecting long term force levels will be the input from the military, primarily based upon the requirements of the Navy and the unified CINCs. Assuming that a global threat

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[17]For a discussion of Base Force issues, see James J. Tritten, "Address to the Submarine Technology Symposium, 12 May 1992," *The Submarine Review* (July 1992), 24-25, and "Chairman's Remarks and Paper - The Submarine's Role in Future Naval Warfare," in *Proceedings of the Fifth Submarine Technology Symposium (U), 12-14 May 1992*, by the Naval Submarine League and Johns Hopkins University - Applied Physics Laboratory (Laurel, MD: Johns Hopkins University - Applied Physics Laboratory, 1992), 45-60, JHU/APL STD-R-2121; and Truver, "Tomorrow's Fleet: Part I," 43.

[18]See Stockton, 83.

does not emerge to threaten US interests, these requirements proposed by the military will probably serve as *ceilings* for submarine force levels.

C. UTILIZATION

The submarine force of the past focused on the submarine as an independent weapon system. Though attempts were made during World War II to use some sort of "wolfpack" formations to attack shipping,[19] for the most part US submarines operated alone. This method of operation continued throughout the Cold War as the emphasis shifted to forward ASW.

The current organization of the submarine force supports this emphasis on independent operation. Submarines are assigned administratively to submarine squadrons and/or groups that are responsible for maintaining the readiness of their respective submarines. The squadrons coordinate the local operations of the submarines for training, exercise, or inspection purposes. While on deployment, the submarines come under the control of the fleet operational commanders and their assignments ensure that there will be no interference or overlap of areas between submarines. There are instances when submarines interact with other US naval forces. However, in the past, these interactions were mostly for training purposes and not a commonplace event. This lack of interaction between the submarine force and other communities to a significant degree was due to the divergence of their Cold War missions. The need for US submarines to concentrate on forward ASW obviated any requirement for consistent sustained interaction with other maritime forces.

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[19]See Clay Blair Jr., *Silent Victory: The US Submarine War against Japan* (Philadelphia and New York: J. B. Lippincott, 1975); and Karl Lautenschlager, "The Submarine in Naval Warfare, 1901-2001," *Naval Strategy and National Security* (Princeton, NJ: Princeton University Press, 1988), 238-284.

As discussed in previous chapters, the roles of the submarine are changing. The overwhelming need for forward ASW is receding rapidly, while the need for joint operations is increasing. The inability of any component of US defense forces to conduct joint operations effectively may result in the virtual elimination of that component in this era of regional warfare. Given this transition in the emphasis of roles and missions, how can the submarine force best organize itself to ensure the most efficient utilization of its declining number of assets to complete those missions assigned to it?

The new roles and missions of the submarine force require the maintenance of the ability to conduct independent operations, but also require the ability to conduct integrated operations not only with maritime forces but with air and land forces as well.[20] The current system of separate submarine squadrons and fleet operational control is well suited to independent submarine operations, however it is *not* suited to joint integrated operations. An over-used but well-meaning maxim in the armed forces is *you fight the way you train*, yet the submarine force in the past rarely trained for joint integrated operations. How can the need for better integrated operations be met?

One answer is to integrate the submarine into the cruiser-destroyer groups of the surface navy community. This organization is ideally structured to provide administrative as well as operational support to a deployable unit.[21] That is, in

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[20]See Vice Admiral Roger F. Bacon, *Submarine Force Vision* ([Washington, D.C.]: Department of the Navy, 1992). The new Submarine force Vision states specifically the goal of the Submarine Force as being to support both the National Command Authority and any Joint Task Force Commander. The need to integrate submarines with other naval forces was also discussed during the Cold War, see Captain John F. O'Connell, "Needed: An Innovative Joint Naval Strategy," *US Naval Institute Proceedings*, August 1983, 107-109.

[21]See David S. Steigman, "Sea services study massive restructuring," *Navy Times*, 3 February 1992, 8. This article discusses the fact that Pacific Fleet units "work in combined administrative and operational squadrons, which combine all maintenance, training and

ideal situations, the members of destroyer squadrons train and deploy *together* either as a Surface Action Group (SAG), or as members of a Carrier Battle Group (CVBG) or an Amphibious Ready Group (ARG). In the future they will deploy together as elements of Naval Expeditionary Forces or Maritime Action Groups (MAG).[22] Integrating submarines into this structure can greatly increase the contributions of the submarine to joint operations. From the perspective of the submarine, it will increase its proficiency at joint integrated operations. From the perspective of the task force, it adds a new dimension that increases the warfighting capability of the battle group with virtually no drawbacks. The submarine as an integral part of a battle group improves the ASW, ASUW, strike, intelligence, surveillance, and early warning capability of the force, while providing a covert capability that does not currently exist. This potential for increasing the battle group's capability can only be realized if the submarine is made an integral part of the battle group structure, operationally and administratively. By being continually involved with attached submarines, the naval commander becomes more aware of the capabilities of the weapons system at his disposal, and can use it more effectively. This integration is already underway to some extent in the Atlantic Fleet with the alignment of two attack submarines with each permanent battle group.[23] . . . *From The Sea* lists the

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deployment functions." The proposed restructuring would incorporate this concept into all Navy commands.

[22]See Department of the Navy, . . . *From The Sea: The Maritime Component of the National Military Strategy* (Washington, D.C.: US Department of the Navy, 1992), 3; Vice Admiral William Owens, "Mediterranean Fleet: A Test-bed for Navy's Future," *Armed Forces Journal*, July 1992, 32-35; and Vice Admiral Roger F. Bacon, "Submarine Warfare - It's A-Changing," *US Naval Institute Proceedings*, June 1992, 53.

[23]Admiral Paul David Miller, "Doing the Job with a Smaller Fleet," *US Naval Institute Proceedings* , April 1992, 57.

integration of attack submarines into naval expeditionary forces as a necessary task for this new regional defense era.[24]

The fact that there are requirements for both independent and integrated joint operations with different support structures does not require that the choice of appropriate support structures for submarines be an "either/or" proposition. The best solution may actually be a combination of the two support structures. For the role requiring independent operations, the current system of separate submarine squadrons and fleet operational control should be maintained. These submarine squadrons could be renamed Submarine *Strike* Squadrons due to their operational emphasis on forward offensive operations against maritime and land targets. These submarines would be co-located with SSBN squadrons. This is due to the similar support structures and due to the ability of strike submarines to maintain proficiency in handling and storage of nuclear weapons (TLAM-N) utilizing the existing support infrastructure for SSBNs. Strike submarines deploying from these squadrons would be so named not for their specific platform capabilities, but for their operational expertise. Figure 4 demonstrates the global reach of these strike submarines.

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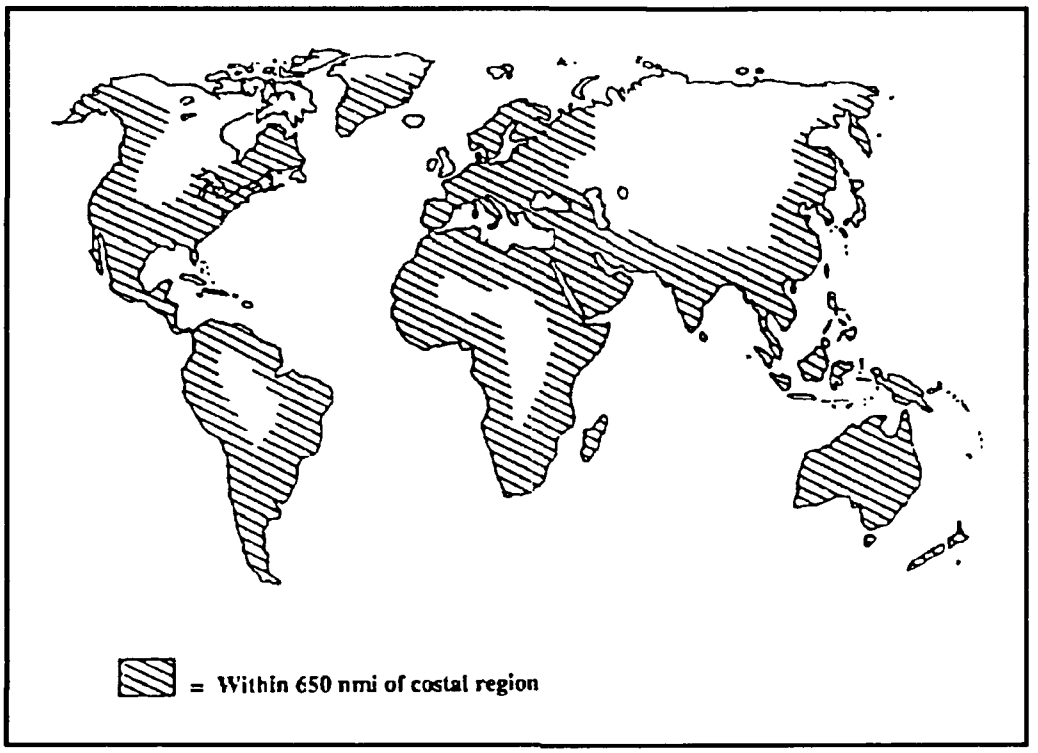
24. . . *From The Sea*, 12.

Figure 4. The Global Reach Of Submarine-Launched Tomahawk Land Attack Missiles



Source: *Submarine Roles in the 1990's and Beyond* (Draft)

For the role of joint integrated operations, submarines should be included in the organization of surface squadrons/groups. A possible name for this organization could be a *Battle Force* Squadron.[25] Battle force submarines deploying with these squadrons would, once again, be so named not for their capabilities but for their operational expertise.

There are considerable advantages to dividing the organization of the submarine force into functional elements for operational specialization. First, it

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[25]For a discussion of battle force combatants for exclusively surface combatant s, see Scott C. Truver, and Commander James A. Hazlett, "Surfacing a New Battle Group," *US Naval Institute Proceedings*, April 1991, 91-88. A more futuristic vision of a battle force squadron is provided by Captain Charles C. Pease, "Sink the Navy!" *US Naval Institute Proceedings*, September 1983, 30-36. Captain Pease discusses the construction of semi-submersibles that would exploit the stealth advantages of submarines for self-defense.

allows specialization as discussed earlier, and strengthens and expands the operational capability of the battle group through experience and continuous training. Secondly, it still provides the unified and fleet CINCs with an independent platform that is capable of responding rapidly without regard to commitments to other forces. It is quite probable that in the event of a major contingency, submarines from both strike and battle force squadrons could operate in the same general area. There would also be some overlap in responsibilities, however the emphasis for both would be different. This would primarily be due to the controlling authority for each submarine. In the case of the Battle Force submarine, the emphasis would be on support of the Battle Group, while the Strike submarine would emphasize support of CINC requirements.

One other factor for submarine utilization is the possibility that the submarine force may find itself in a position that it may not have enough submarines to meet existing requirements while at the same time meeting operational tempo (OPTEMPO) requirements. A solution to this problem would be to utilize the two crew concept used by US SSBNs to maximize the at-sea time for the submarines.[26] This concept is expensive in terms of personnel and maintenance costs, however, in the future it may become the only option.

To summarize, the transition of roles and missions of the submarine force from a Cold War emphasis to a regional contingency emphasis requires a concurrent transition in organization to effectively utilize diminishing assets. There is a continued need for the submarine to perform as an independent unit,

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[26]See P. Kevin Peppe, "Centurion: The Changing Future of the Force," *US Naval Institute Proceedings*, April 1992, 60-64.

but there is also a growing need for the submarine to perform a joint integrated role with other maritime forces. The current organization is excellent for independent operations but handicaps the exploitation of the full potential of joint integrated operations. What is needed is a division of submarines into functional elements for operational specialization. One element would retain the current organization for support of the submarine as an independent platform controlled by fleet or unified CINCs. The other would incorporate submarines into the operational organization of surface forces. This would allow for the exploitation of the submarine potential as an integral member of a battle group. One other factor in submarine utilization relates to the two crew concept. This concept may be required in the event that submarine mission requirements outstrip the number of submarines available within OPTEMPO constraints in the future.

D. CONCLUSIONS

Today, the issue of force structure in the Department of Defense is a contentious one. The debate is ongoing not only in the Pentagon, but in the halls of Congress as well. It is important to note that the debate over force structure does not simply involve raw numbers of ships. It also involves the necessary organization of the Navy to effectively utilize its diminishing assets. Efforts are currently underway to reorganize the Navy headquarters in order to respond to the changing national security situation. Similar efforts are being considered at the fleet level in order to effectively integrate a smaller Navy. These efforts should include reorganizing the submarine force into functional elements that allow for operational specialization. This specialization will add to and strengthen the capability of deploying battle groups by integrating submarines

into the administrative and operational organization of cruiser-destroyer groups. In addition, the ability of submarines to operate independently for fleet and unified CINC disposal will be maintained using the current submarine organization.

This chapter's discussion of force size should illuminate some important points. The most important is that both the short term and long term factors affecting the rate of submarine force structure reduction and the ultimate force structure level are primarily economic and beyond the control of the Navy and the Department of Defense. This does not imply that the Navy should cease in stating its case in the current debate, but that it be aware of these other factors in addition to the traditional inputs for force levels provided by the military.

IV. FUTURE SUBMARINE DESIGN

A. INTRODUCTION

Submarine design developments are a true indication of the long term direction of the submarine force in this time of tremendous change. Roles and missions and force structure changes will succeed in the short term in adjusting to major shifts in the international security environment, but these changes will only be perpetuated in the long term if followed up by changes in submarine design. The issue of submarine design, like the issue of force structure, has been in the spotlight recently due to the proposed cancellation of the *Seawolf* attack submarine program after procurement of only one submarine. The purpose of this chapter is to assess the design issues that need to be addressed to support the submarine force of the post-Cold War world. These issues include the factors affecting the transition from a Cold War emphasis to a regional warfare emphasis, and the factors affecting the long term strategy for submarine design and development.

B. SHORT TERM OR TRANSITION REQUIREMENTS

The current state of affairs surrounding the *Seawolf* class submarine and its apparent successor, the *Centurion*, will dominate the short term requirements for submarine design. Factors that will affect these requirements are the submarine industrial base issue, affordability, the transition to a regional emphasis on submarine design, and Russian concerns over construction of the *Seawolf*.

1. The Submarine Industrial Base

The time table for production of the follow-on submarine, tentatively called *Centurion*, will depend mainly on the outcome of the study on the submarine industrial base. If this study determines that the submarine industrial base is in danger of collapsing due to the cancellation of the Seawolf program, then it will require the earliest construction of the new submarine. Conversely, if the industrial base study determines that a temporary hiatus can be successfully weathered, then the construction date will probably be pushed back. The reason that the construction of the follow-on submarine will be so closely tied to the submarine industrial base issue is the fact that the submarine force can not currently justify its current force size on existing requirements. There is no need to construct new submarines beyond those already under construction in this decade to meet projected force size requirements.[1]

The time table for construction will have a significant impact on the amount of change that can be incorporated into the new submarine design. A compressed time table will necessitate the use of existing "off the shelf" technology that borrows heavily from the designs of previous submarines with their emphasis on Cold War missions.[2] An extended time table will allow for

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[1]This is based on an assumed force requirement of 60 submarines or less by the end of the century. Given that the submarine force currently has 84 submarines with 14 still under construction, there is no demonstrated need for any additional construction to support a force of 60 boats. See also Donald C. Daniel, *Beyond the 600-Ship Navy*. Adelphi Paper 261 (London: Brassey's for International Institute of Strategic Studies, 1991), 35; "In short, if there is any one warship type in the *circa* 2000 inventory whose numbers seem unambiguously ample for regional contingencies, it is the general-purpose submarine."

[2]This is in fact what is shaping up to be the requirement for *Centurion*. See "Acquisition Board Approves Concept Phase For Navy's *Centurion* Submarine," *Inside the Navy*, 24 August 1992, 3. "As a way of reducing the cost of the Centurion, the attack submarine will incorporate technologies from Los Angeles Class and Trident ballistic-missile submarines, the report said."

more integration of new design features that will meet the requirements for a regional warfighting submarine. The issue of the submarine industrial base will be the primary driver for short term submarine design.

2. Affordability

Closely related to the issue of the submarine industrial base is the issue of affordability. The Seawolf program is primarily a casualty of economics. It is not a difficult task to argue that the Seawolf would be a viable program today, though significantly scaled back, if it was perceived as an affordable weapon system.[3] What had been perceived as affordable in the Cold War is no longer tolerable in the immediate post-Cold War world. The short term design requirements of the new submarine will be heavily influenced by the need to construct a capable submarine that is affordable as measured by the new post-Cold War frame of reference. This has been described as in the cost range of the improved 688 class submarine ($1.6 billion for first ship), but with an improved capability.[4] This emphasis on affordability began to appear with the design process of the Seawolf, however, its overriding impact is something new to the

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[3]Senator John McCain, an opponent of the *Seawolf*, has stated many times that his opposition to the program is based on more pressing needs for the funds in other defense programs. See Congress, Senate, Senator McCain of Arizona speaking on an Amendment to terminate the *Seawolf* program, 102nd Cong., 1st sess., *Congressional Record* (26 September 1991), 13752-61; and Senator McCain of Arizona speaking on an Amendment to rescind funds for the *Seawolf* program, 102nd Cong., 2nd sess., *Congressional Record* (5 May 1992), 5960-62 and 5972-76.

[4]See the comments of Ronald O'Rourke in "Address to the Submarine Technology Symposium, 13 May 1992," *The Submarine Review* (July 1992): 37-40, or "Second Luncheon Address," in *Proceedings of the Fifth Submarine Technology Symposium (U), 12-14 May 1992*, by the Naval Submarine League and Johns Hopkins University - Applied Physics Laboratory (Laurel, MD: Johns Hopkins University - Applied Physics Laboratory, 1992), 21-30, JHU/APL STD-R-2121.

process.[5] It requires the reorientation of the submarine industrial base towards the goal of not only providing a product that is more capable, but one that is affordable as well. "The challenge for industry is not to make submarines more capable and quieter but rather to find ways to reduce prices without sacrificing our technological edge. This is not a minor challenge and will take our best and brightest."[6] The obvious motivation for doing this is provided by the fact that the virtual survival of the submarine industrial base hangs in the balance.

3. Transition to Regional Warfighting Emphasis

In order for the new submarine to be accepted for procurement, in addition to meeting affordability goals, it must be seen as meeting the new requirements for conducting regional warfare. This must be done in order to prevent a repetition of the arguments made against the Seawolf program, namely that it was too costly and was a Cold War weapon system. This regional warfighting capability and its resulting design requirements will be discussed more fully in the following section. In general, however, the need to design for conducting regional warfare requires an emphasis on littoral warfighting capability, such as shallow water operations, strike warfare, and special operations, and a deemphasis on open ocean warfare, particularly ASW against a Soviet threat. This is not to say that the submarine should shed one capability in

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[5]One discussion of *Seawolf* submarine design technology is the Government Accounting Office, "Submarine Technology," *Report to the Chairman, Subcommittee on Projection Forces and Regional Defense, Committee on Armed Services, U.S. Senate* (Washington, D.C.: U.S. GAO, 1990).

[6]James J. Tritten, "Address to the Submarine Technology Symposium, 12 May 1992," *The Submarine Review* (July 1992): 25, or "Chairman's Remarks and Paper - The Submarine's Role in Future Naval Warfare," in *Proceedings of the Fifth Submarine Technology Symposium(U), 12-14 May 1992*, by the Naval Submarine League and Johns Hopkins University - Applied Physics Laboratory (Laurel, MD: Johns Hopkins University - Applied Physics Laboratory, 1992), 45-60, JHU/APL STD-R-2121.

favor of another. In fact, the submarine capabilities will change minimally. The major changes will occur in emphasis on strengthening and improving specific capabilities.

4. Russian Concerns over Construction of the *Seawolf*.

Though what remains of the Soviet Union has rapidly receded from US consideration as a threat, it can not be ignored altogether. The military still wields considerable power in the republics. The Soviet Navy has been primarily transferred intact to the Russian republic. Due to the enormous capabilities of the *Seawolf* submarine and due to its obvious design for operations against the Soviet Union, continued construction of *Seawolf* could send the wrong signal to military authorities in Russia. By suspending construction of the *Seawolf*, and proceeding with construction of a submarine that is designed for regional (not anti-Russian) warfare, the US can remove possible justification for excessive military expenditures by the Russian republic.

In summary, submarine design in the short term will be affected primarily by issues unrelated to military utility. The primary factor affecting design will be the issue of the submarine industrial base. The reason that the construction of the follow-on submarine will be so closely tied to the submarine industrial base issue is the fact that the submarine force can not justify its current force size on existing requirements. The industrial base issue will determine when the new submarine must be constructed in order to maintain the viability of the industrial base. This time factor will determine the magnitude of change that can be included in the new submarine design. A second related factor will be affordability. The need to provide a submarine that is both capable and affordable is vital to ensure that the US will continue to field a submarine force

that is similar to the one that exists today. Related to this factor is the ability of the new submarine design to incorporate changes that increase the regional warfighting capability of the submarine. This in addition to the issue of affordability is vital to overcoming the stigma that submarines are too expensive and designed solely for the Cold War. These three factors are distinct but interrelated. They reflect the short term requirement of submarine design as that of maintaining the capability of the submarine as a weapons system for the United States through the production of a capable but affordable submarine that ensures the viability of the submarine industrial base. The short term requirement is not that of maintaining submarine force structure, which is shrinking. A final factor in the short term is the perceived affect of continued *Seawolf* production on the Russian republic. The US can not afford to send the wrong signal to military authorities in Russia as that republic struggles to institute democratic and free market reforms.

C. LONG TERM STRATEGY

The long term strategy for submarine design procurement must be specific enough to deal with the apparent directions of the current international security environment, but at the same time be general enough to deal with the inexactness of predicting the future. As a result this section will be concerned with the general design features that must be addressed in the new design submarine for regional warfighting, and the need to maintain flexibility in submarine capability.

1. Design of the Regional Warfighting Submarine

The enormous changes in the international environment and the many misperceptions associated with the Seawolf program require that a long term

view of submarine design not be limited to evolutionary improvements upon existing US submarines. In order to avoid the stigma of being stuck in the Cold War, the Navy must start from virtually scratch in its design approach to a regional warfighting submarine. Issues that must be addressed include the propulsion system, weapons capability, sensors and electronics, and the platform itself. These issues must be understood to be constrained by economics, as discussed in the previous section. Affordability, in a period of no distinct global threat, will remain one of the highest priorities in submarine procurement.

a. Propulsion System

Since the advent of nuclear propulsion for submarines, the debate over the propulsion system for US submarines has been fierce and rancorous.[7] This debate appeared to have been resolved during the 1980s as the superior capability of the nuclear submarine was demonstrated and as the US submarine force began to retire its last diesel submarines. This new era requires an examination of alternate methods of propulsion to nuclear power. The reasons behind this include the increasing potential of Air Independent Propulsion (AIP), and the perception that nuclear propulsion is prohibitively expensive.

The Navy has stated its position for many years that nuclear propulsion is the desired propulsion system for submarines. The reasons for this position include increased speed, endurance, firepower, and sensor capability.[8]

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[7]Examples of this debate include, Commander Daniel Conley, Royal Navy, "Don't Discount the Diesel," *US Naval Institute Proceedings*, October 1987, 74-81; Vice Admiral N. R. Thunman, "Diesel Submarines for the U.S. Navy?" *US Naval Institute Proceedings*, August 1985, 136-7; and Commander John L. Byron, "Diesel Boats Forever?" *US Naval Institute Proceedings*, December 1982, 35-42.

[8]Department of the Navy, Assistant Chief of Naval Operations (Undersea Warfare), *Submarine Roles in the 1990's and Beyond* (Washington, D.C.: US Department of the Navy, 18 January 1992), 5-6.

These attributes are needed for the US submarine force because of the unique roles and missions assigned to it. These roles and missions are those that are concerned with regional warfare, namely rapid and sustained response with a multimission capability.[9] These attributes are not necessarily needed for submarines of other countries, such as the Third World or European countries, due to the coastal defense roles of their submarine forces.

Air Independent Propulsion has shown increasing promise as a means of providing another method for submarines to sever their dependence on the surface of the ocean. These AIP systems utilize systems that are closed-cycle and thus do not require a continuous flow of air to operate.[10] This technology deserves considerable attention by the United States both as a potential replacement for nuclear propulsion and as a potential threat if utilized by countries whose interests conflict with ours. A number of factors will affect the future of AIP as a design feature in future US submarines. The first is that this technology must demonstrate that it is comparable to nuclear power in terms of providing sustained speed, and endurance for a platform capable of conducting regional warfare missions. To date, this has not been demonstrated. Second, in order for the United States to shift its propulsion means from nuclear power to AIP, it must be affordable. Currently there appears to be difficulty in developing an effective AIP system that will compete in costs with contemporary diesel

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[9]See Vice Admiral Roger Bacon, "Q & A with Vice Adm. Roger Bacon," interview by Richard Lawson, *Inside the Navy*, 24 August 1992, 8. "Five studies in the last 12 years have confirmed that conventionally powered submarines do not fit with the U.S. global military strategy. Nuclear power gives us the ability to maintain forward [presence] and respond to regional crises quickly."

[10]For a good summary of advances in AIP see Eric Grove, *The Future of Sea Power* (Annapolis, MD: Naval Institute Press, 1990).

submarine propulsion systems. It is unlikely in the near term that AIP can cost effectively compete with nuclear power for the propulsion requirements for US submarines.

Given that AIP is still in the development stages, another alternative is to utilize existing diesel submarines technology for future US submarines. This alternative will require a fundamental change in not only submarine roles and missions, but in submarine basing as well. As discussed previously, current submarine roles and missions require a submarine that has high speed, endurance, and the electric power generating capability to support advanced weapons systems.

Current diesel technology, though potent and capable, clearly falls short in the endurance requirement. This shortcoming can be overcome by the use of forward basing of US diesel submarines, such as was done in the past. This new requirement for forward basing appears to run contrary to current trends in US defense policy. That policy involves the closing of significant military bases abroad. A policy of forward basing US diesel submarines in the future provides the potential for disagreement between the host country and the United States over the use of its submarine in a regional conflict or crisis. This may in effect limit the flexibility of using the submarine as an instrument for signaling or gunboat diplomacy. One possible solution is the use of US submarine tenders located in international waters as portable bases for diesel submarines. This option, too, may impact on the roles and missions of the submarine and on the ability of the submarine to conduct covert operations.

The possibility of using conventional diesel technology for US submarines appears to be based more upon desires to achieve economic rewards

than for providing an effective weapons system. It is a possibility, however, and should not be dismissed out of hand. Instead, the possible drawbacks must be outlined, explained and weighed against the possible economic benefits of such a decision.[11]

b. Weapons Capability

The regional warfighting submarine will be concerned primarily with littoral warfare.[12] This puts an emphasis on power projection ashore, the capability to conduct shallow water sea denial against surface ships and submarines, and near shore covert operations, such as intelligence collection, surveillance, and special operations. During the Cold War, the emphasis for weapons was on the heavy torpedo capable of destroying or disabling a fast, deep-diving nuclear submarine in the open ocean. One of the cost effective criteria for this new regional warfighting submarine will be its weapons load out per unit cost. A related criteria for the Navy or a unified CINC is the firepower or rate of fire of the submarine.[13] These criteria taken together point to the development of a cruise missile submarine that retains the capability to launch

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[11]This discussion is in fact in progress as a result of the *Centurion* Acquisition Decision Memorandum. It specifically requires that the Cost and Operational Effectiveness Analysis (COEA) for the *Centurion* include as an option a conventionally powered submarine, including the possible overseas basing of these submarines. See "Yockey Grabs Tight Control of Navy's Nest-Generation Submarine Design Studies," and "Centurion Acquisition Decision Memorandum," *Inside The Navy*, 7 September 1992, 1 and 7-9; and Robert Holzer, "Centurion Sub Study to Add Diesels," *Defense News*, 21-27 September 1992, 3 and 37.

[12]Much of this section is based on insights provided by a recent Joint Staff study on submarines in regional warfare, see Department of Defense, Joint Staff, Deputy Director for Assessment/J8, "Final Report," *Potent Striker I* ([Washington, D.C.]: US Department of Defense, 1992).

[13]See "Centurion Design Places Great Emphasis On Ability To Deliver Tomahawk Missiles," and "Navy Report on the New Attack Submarine (Unclassified Version): Executive Summary," *Inside The Navy*, 27 July 1992, 1 and 8-15.

torpedoes. This is a fundamental shift in weapons capability emphasis for submarines that in the past relied primarily on heavy torpedoes as the weapon of choice.[14] One other weapon for regional defense will be the "proportional response" weapon capable of disabling vice destroying vessels engaged in weapons or drug smuggling, minelaying, or piracy. The need for a high firepower rate requires the use of missile launchers such as the VLS tubes on improved 688 class submarines or possibly the addition of a modular missile bay to the hull similar to those used for ballistic missile submarines. The key for the design of the regional warfighting submarine is to emphasize those weapons that will most likely be used. In this case, those weapons are cruise missiles, either land or sea attack variants. Additionally the weapons load out capability should be significant to make the platform more cost effective, while at the same time providing a firepower rate that meets the requirements of the unified CINCs.

c. Sensors and Electronic Capability

With the emphasis on littoral warfare and support of joint integrated operations, this category should be the focus of intensive research and development to increase submarine capability. In the past, this category has focused on increasing the sensors and electronic capability of the submarine in relation to its ASW mission. For regional warfare increased emphasis should be placed on expanding the submarine's battle space, and providing connectivity between the submarine and other forces.

The submarine's battle space in a regional warfare context is currently limited by its environment and its ability to use off hull sensors. Due to

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[14]This fundamental shift appears to be recognized by the submarine force, see Vice Admiral Roger F. Bacon, "Submarine Warfare - It's A-Changing," *US Naval Institute Proceedings*, June 1992, 52.

the revolutionary improvements made in US submarine design in terms of quieting and sonar sensors, the future US submarine's underwater horizon will be limited not by its sensors or the self-noise of the submarine, but by the limits of the environment itself. In shallow water areas, the acoustical environment can be very limiting. Above the surface of the water, the submarine's visual and, to some extent, electronic horizon is limited by the physical proportions of the sensor, namely the height of the mast, rather than by the technology of the equipment. Thus, it appears that the submarine may have reached its limit in expanding its battlespace through its own organic sensors.[15] There is still room for improvement, especially in incorporating new fiber optic and low observable technologies to submarine mast. However, these design improvements will serve simply to improve the quality of the data within the submarine's battle space, rather than expanding it.

How, then, can the submarine expand its battle space? The answer lies in exploiting off-hull sensors, in particular, the use of unmanned underwater vehicles (UUVs) and unmanned aerial vehicles (UAVs). UUVs can be either expendable or retrievable, tethered or non-tethered. These could be used in a shallow water environment be for mine detection/avoidance, against quiet diesel submarines for detection, decoy or attack, and for navigation in restricted or uncharted waters. UAVs will have similar roles to those envisioned for UAVs used off of surface ships. These include naval gunfire support, target

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[15]This realization appears to be reflected in the final report of the Defense Department's Science and Technology Strategy, which omitted "almost all references to the Navy's future attack submarine as part of a top-level demonstration needed for the technical areas called "Sea Control and Undersea Superiority."" Instead a "philosophical change" has occurred emphasizing more off-platform sensors. See "'Philosophical Change' Lessens Role of Submarine as Technology Demonstrator," *Inside the Navy*, 3 August 1992, 1.

identification, third-party terminal guidance for precision guided munitions, and reconnaissance. These UAVs may not be for the sole use of the submarine. The submarine may simply be the best platform for launching the UAV and may "hand off" control of the UAV to some other platform. Similarly, the submarine may assume control of a UAV in order to assist other forces in the region.

The ability to utilize these unmanned vehicles assumes the submarine has the ability to maintain reliable communications links with these systems. In addition to the requirement for communications with these systems, the regional warfare submarine will also be required to maintain reliable communications with all other forces in the region in order to be an effective contributor. This emphasis on *connectivity* with other maritime forces is something new to the submarine force. In fact, the inability of the submarine to communicate effectively with other naval forces has been used as an argument against integrating submarines into battle groups. In this new era of regional warfare, this communications stumbling block must be overcome. There are a number of programs underway to increase the connectivity of submarines with other forces. This should become a priority in order to ensure the regional warfare submarine can contribute its full potential to the US regional warfighting capability.[16]

d. Platform

This issue involves primarily the direction to be taken in platform development. This is one design category that lends itself quite well to evolutionary development from previous designs. The basis of the submarine

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[16]For a discussion of submarine communications capabilities and recommendations for the future see Captain Robert Carlin, "Communicating with the Silent Service," *US Naval Institute Proceedings*, December 1981, 75-78.

defense is its ability to remain undetected. This ability precludes the expenditure of resources to strengthen the hull against battle damage, and for the procurement of point-defense weapons like anti-torpedo torpedoes. Maintaining the current US advantage in submarine quieting ensures that the weapons carried by the submarine are primarily offensive in nature. Current US submarine design has reached the point that the submarine is virtually as quiet or quieter than its environment, particularly in shallow water. This design feature, coupled with other measures that reduce the detectability of submarine through active sonar or other means, should not be sacrificed in order to achieve cost savings. Instead, this capability should be seen as a baseline performance criteria. The emphasis on design for the platform should be to maintain this baseline while simultaneously reducing the costs to achieve it. By maintaining the submarine's strength as a stealthy, covert weapons system, this allows resources to be allocated to increasing the submarine's *offensive* capabilities vice creating new *defensive* capabilities.

2. Flexibility in Submarine Capability

Looking at the history of the development of the submarine as a weapons system, it is significant to note its ability to adapt to changing international events.[17] The submarine has adjusted its role many times this century. Each time that the international situation changed, the submarine changed with it to meet emerging requirements. Even while doing so, the submarine retained its abilities developed for the previous situation. Thus, the submarine developed as a weapon against surface ships, but progressively improved its capability to include anti-submarine warfare, special operations,

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[17] *Potent Striker*, Enclosure 2.

surveillance, intelligence collection, and finally strike warfare. It is important to draw a lesson from this history. While the international system has changed to necessitate a change in emphasis on submarine design, it does not require that the submarine automatically eliminate other capabilities. To do so may prevent the submarine from adapting to the next major international change which will inevitably occur during the design lifetime of the next generation submarine.

There are a number of options to maintain submarine design flexibility. The first option is that which has been used in the past, to incorporate the same capabilities into all submarine classes. The second is to break from the past and build two or more classes of submarines that meet different requirements. This approach is similar to the arguments in the 1980s over aircraft carrier procurement. There was a debate over the issue of building small numbers of huge aircraft carriers when one could build a larger number of smaller carriers for the same price. In the case of the submarine force, there would be two or more classes of submarines built simultaneously. The first and most numerous class would be the regional warfighting submarine that emphasizes littoral warfare capabilities and minimizes, or possibly eliminates, open ocean warfare capabilities. The second class of submarines would emphasize multimission capability across the warfare spectrum. This would provide a baseline design from which the submarine force could rapidly adapt to changing international events such as an emergent global threat. For instance, this design could provide the platform for a follow-on to the Trident ballistic missile submarine if a significant threat necessitates it. Similarly, this design could be used to reconstitute a true open-ocean ASW capability rapidly.

A third option for maintaining submarine design flexibility is the use of modular construction. This approach would involve the design of a basic submarine that would possess necessary platform characteristics as discussed previously. This basic submarine would then be modified to suit existing or perceived needs for the unified CINCs. These needs would include those for regional warfighting, open-ocean ASW, or strategic nuclear deterrence. These needs would be satisfied by constructing the required number of submarines with these pre-designed modular warfare "packages" installed.[18]

Obviously, the issue of submarine design flexibility in the short term is a moot one due to the current evolutionary design process of submarines. In the future, however, desires to concentrate solely on regional warfare coupled with the need to maintain affordability may overwhelm the need to maintain submarine design flexibility. One solution is to build limited numbers of true multimission submarines in conjunction with regional warfighting submarines. Another option is to apply modular construction techniques to a basic submarine design.

D. CONCLUSIONS

To summarize this chapter, the issue of submarine design is currently a hot topic due to the decision to cancel the Seawolf submarine program. Besides the current political arguments, submarine design is important because it reflects the long term direction of the submarine force. Because of the rapid pace of both international and domestic events, the issue of submarine design must be looked at from short term and long term perspectives.

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[18]See "Modular Submarines Among Options for 2010," *Navy Times*, 7 October 7 1991.

Submarine design in the short term will be affected primarily by issues unrelated to military utility. The primary factor affecting design will be the issue of the submarine industrial base. The reason that the construction of the follow-on submarine will be so closely tied to the submarine industrial base issue is the fact that the submarine force can not currently justify its current force size on existing requirements. The industrial base issue will determine when the new submarine must be constructed in order to maintain the viability of the industrial base. This time factor will determine the magnitude of change that can be included in the new submarine design. A second related factor will be affordability. The need to provide a submarine that is both capable and affordable is vital to ensure that the US will continue to field a submarine force that is similar to the one that exists today. Related to this factor is the ability of the new submarine design to incorporate changes that increase the regional warfighting capability of the submarine. This in addition to the issue of affordability is vital to overcoming the stigma that submarines are too expensive and designed solely for the Cold War. These three factors are distinct but interrelated. They reflect the short term requirement of submarine design as that of maintaining the capability of the submarine as a weapons system for the United States through the production of a capable but affordable submarine that ensures the viability of the submarine industrial base. The short term requirement is <u>not</u> that of maintaining submarine force structure, which is shrinking. A final factor in the short term is the perceived affect of continued *Seawolf* production on the Russian republic. The US can not afford to send the wrong signal to military authorities in Russia as that republic struggles to institute democratic and free market reforms.

In the long term, the approach to submarine design must make minimal assumptions in order to deflect criticism that it is stuck in the Cold War. It must concentrate on the areas needed to produce a regional warfighting submarine. This includes a return to the issue of submarine propulsion. AIP as a potential propulsion means for submarines should not be ruled out in the future. The critical factors that AIP must be able to meet are speed, endurance, and affordability in comparison to nuclear propulsion. Conventional or diesel propulsion is also an option, however, it has distinct disadvantages compared to nuclear propulsion. These disadvantages would require a fundamental adjustment of submarine roles and missions and a policy of forward basing that appears to run contrary to current developments.

The regional warfighting submarine must have a design emphasis on those weapons that will be used in joint littoral warfare. This translates into the ability to carry large numbers of cruise missiles and fire them rapidly. In addition, the need for carrying large numbers of heavy torpedoes will be significantly reduced. One other consideration is the development of a "proportional response" weapon capable of disabling, vice destroying, vessels engaging in drug/weapon smuggling, minelaying, or piracy. These are fundamental changes from past submarine design requirements.

In order for the submarine to be an effective contributor to a regional conflict, it must be able to expand and dominate its battlespace and maintain contact with other forces. The current battlespace of the submarine appears to be platform limited. As a result in order to expand the battlespace further requires the use of unmanned vehicles. These vehicles can be used either underwater or in the air in order to vastly improve the submarine's horizon and its effect on the conflict.

The need for the submarine to maintain contact with other forces is paramount in this new emerging era of joint combined operations. If the regional warfighting submarine does not have the means to communicate effectively and consistently with other forces, it cannot justify a major role in regional warfare.

The extent of submarine platform design appears to have reached its zenith with the Seawolf program. The submarine's best defense is its ability to remain undetected. As a result, the current performance characteristics of US submarines should be maintained as a baseline, while research and development should focus on the means to maintain the performance while reducing costs.

Finally, in the rush to redirect the submarine design process towards a regional warfighting emphasis, it is important to note the historical development of submarine design. Throughout its relatively brief history, the submarine has been able to adapt to tremendous changes in the international environment. This is due to its flexibility in design. While additions were made in submarine capability, old capabilities were maintained. The result has been a multimission capable platform that is flexible enough to respond to the demands of the post-Cold War world. In designing the regional warfighting submarine of the future, there are three options to ensure that design flexibility is maintained. One is to continue current practice and design a multipurpose platform capable of operating across the spectrum of conflict. A second option is to design two classes of submarine, one to deal with the specific requirements of regional warfare, the other to maintain design flexibility and multipurpose, multispectrum capability. Another option is to apply modular construction techniques to a basic submarine design.

The short term issue of submarine design appears to be taking center stage due to the concerns over the submarine industrial issue. It is important that the Navy also take a long term view of submarine design and confront the issues that need to be faced in the transition to a regional warfighting capability. It appears that the Seawolf submarine program is being seen as the transition to the post-Cold War era, and the Centurion program will be the first post-Cold War submarine. Looking at this issue objectively, it will be very difficult for the Centurion to completely divorce itself from many Cold War design characteristics simply due to the short period of time that will be required for actual construction of the first ship. Using the *Centurion* project as a springboard, the Navy should begin concurrent development of a regional warfighting submarine that will begin production in the early 21st century in order to replace the *Los Angeles* class submarines as they are retired.

V. CHANGING DIRECTIONS

A. INTRODUCTION

This thesis has discussed the dramatic changes that have occurred in the international security environment and the resulting response of the United States to meet the new and emerging challenges of the post-Cold War world. These changes have led to the development of a regional defense strategy[1], which has implications on every military service and warfare community. In regards to these implications, submarine roles and missions, force structure, and design have been addressed. These three issues are interrelated. Roles and missions must be the first to change in order to meet the new demands of the regional defense strategy. Force structure must be addressed to allow the submarine force to best complete its assigned roles and missions. Submarine design is important for the future in adapting more fully to the needs of the regional defense strategy. These three issues are important and vital to the continued contribution of the submarine to supporting US national security interests.

Just as important, however, is the way the submarine force presents itself in the continuing debate over the shape of the future US military. In this post-Cold War world, the rules have changed in the national security debate. If the submarine force expects to contribute to the post-Cold War world, it will have to

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[1]See President, *National Security Strategy of the United States* (Washington, D.C.: GPO, 1991); General Colin L. Powell, *National Military Strategy 1992* (Washington D.C.: GPO, January 1992); and Department of the Navy, . . . *From The Sea: Preparing the Naval Service for the 21st Century* (Washington D.C.: US Department of the Navy, 30 September 1992).

change as well. Specifically, the submarine force must change its frame of reference, take the "silent" out of the silent service, and aggressively engage the Congress in the decision making process for submarine issues.

B. ESTABLISHING THE PROPER FRAME OF REFERENCE

In a time of tremendous change, the initial reaction to external pressures on an institution is to resist efforts to alter the status quo. This reaction is even more pronounced when the status quo has been shaped and maintained over a forty year period. Thus, every recommendation to change is seen as a major battle that will affect the survival of the entire institution. In this type of environment, rational management of change rapidly degenerates into crisis management to resist change.

As the Cold War came to a close, virtually every segment of the defense establishment from the top levels of the Defense Department down to the individual services fell into this pattern. As the Soviet Union rapidly disintegrated before our eyes, attempts were made to identify other sources of threats that could restore the comfortable Cold War justification of defense expenditures. Even after it became obvious that the Soviet Union was collapsing, top officials of the Defense Department and the individual services were still justifying their budgets on the Soviet threat.[2]

The behavior of the submarine community is a good example of these efforts. Following the fall of the Berlin Wall, and amid calls for decreased defense spending and growing concerns over the costs of the *Seawolf* program, Navy

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[2]See Paul N. Stockton, "The Congressional Response," in *Reconstituting America's Defense: The New U.S. National Security Strategy*, ed. James J. Tritten and Paul N. Stockton (New York: Praeger Publishers, 1992), 69-74.

officials sought to justify procurement of *Seawolf* and the maintenance of a large attack submarine force based on an effort to emphasize the growing threat of diesel submarines. This effort became transparent upon closer examination. In addition to this, attention was focused on the unabated construction rates of Soviet submarines. Soon it became obvious that this trend was the result of inertia rather than a calculated effort on Soviet authorities. The result of these seemingly frantic efforts was to damage the credibility of the submarine force and to reinforce the misperceptions that the submarine was solely an anti-submarine warfare (ASW) weapon and that it was an obsolete Cold War weapon.[3]

There are a number of lessons to be gained from this initial experience with the post-Cold War defense debate. The first is that a significant effort must be made to rebuild the credibility of the submarine community and to correct the misperceptions about the utility of the submarine in the post-Cold War world. The second lesson is that the rules have changed in the defense debate and the submarine force needs to comprehend these changes and adapt its behavior in the post-Cold War defense debate.

The first step in changing directions for the submarine force is to establish a new frame of reference that is more applicable to the current environment. The Cold War provided the military services with an environment that had a consistent global threat. This environment provided a "safety net" for the warfare communities in that there was no debate over the purpose for specific

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[3]See Ronald O'Rourke, "Address to the Submarine Technology Symposium, 13 May 1992," *The Submarine Review* (July 1992): 31-32, or, "Second Luncheon Address," *Proceedings of the Fifth Submarine Technology Symposium (U), 12-14 May 1992* (Laurel, MD: Johns Hopkins University - Applied Physics Laboratory, 1992), 21-30, JHU/APL STD-R-2121.

forces. There was consensus all around for the need for significant military forces to defend against the Soviet Union. This consensus allowed the debate to center around lower level issues such as force structure and research and development. In this environment, each issue could be seen as a separate battle.

In the post-Cold War world, the defense debate is radically different. The debate has shifted away from the individual issues and up to the justification of forces. Thus, we see significant debate on the need for B-2 bombers, nuclear ballistic missiles, and *attack submarines*.[4] This shift in focus in the defense debate requires a concurrent shift in the way the submarine force presents its arguments. The focus should shift away from individual issues such as roles and missions and force structure, and shift towards justification of the need for the submarine in the United States military. The submarine force must construct a vision that incorporates the individual issues into a coherent package that fits neatly into the new concept of national security.[5] The relevant issues for the submarine force should be discussed not from the aspect of "is this good for the submarine force?," but rather from the perspective of "how does this contribute to national security?" This frame of reference if utilized with vigor, will help to restore credibility to the submarine force on current issues and will dovetail well with the current transformation of the military that was started with the new *National Security Strategy of the United States*.

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[4]An example of this debate is the Air Force's attempt to justify the existence of the B-2 bomber by citing its potential as a *conventional* bomber.

[5]This is James L. George's point for the vision of the Department of the Navy in, "A Strategy in the Navy's Best Interest," *US Naval Institute Proceedings*, May 1991, 114-123. See also Admiral Sir Julian Oswald, "Security Has New Meaning," *US Naval Institute Proceedings*, May 1992, 51. "[W]e in the military must warmly embrace wider concepts: not just defense, narrowly defined, but security, widely interpreted."

C. TAKING THE "SILENT" OUT OF THE SILENT SERVICE

For years the submarine service has been shrouded in secrecy. The need for secrecy and reticence to discuss operations was a necessary fact during the Cold War. The need for the same level of secrecy is no longer apparent in this new post-Cold War era and may in fact harm the submarine force in its efforts to participate in the defense debate. The focus of this new openness should be on providing the evidence necessary to prove that the submarine is in fact a capable weapons system for the regional defense strategy. This could be done through selective declassification of past submarine operations, similar declassification and promotion of submarine capabilities, and emphasis on the relative invulnerability of submarines.

Due to the shroud of secrecy surrounding all US submarine operations during the Cold War, few outside the Navy truly understand the capabilities and potential of the submarine as an instrument of national security. Now, in order to defend itself fairly in the defense debate, the submarine force must selectively declassify its operations and demonstrate to the other services and to the public the true potential of submarines.[6] The term "selectively declassify" is chosen with a purpose. Just as the secrecy surrounding Cold War operations will hinder efforts to justify the submarine, so too will excessive attention to past exploits of US submarines. It is not appropriate to reveal details of US submarine operations against the Soviet Union. This is due to the need to foster better relations with the republics of the former Soviet Union, and due to the fact that those operations were generally in support of a strategy that is no longer

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[6]Vice Admiral Roger Bacon, "Q & A with Vice Adm. Roger Bacon," interview by Richard Lawson, *Inside the Navy*, 24 August 1992, 7. "We are trying to look at some of the regional crises and declassify aspects of operations where submarines have been involved."

relevant. Concentrating on operations against the Soviet Union, thus, will only perpetuate the myths that the submarine is a relic of the Cold War, and only capable of performing ASW. But throughout the Cold War, US submarines were involved in regional contingencies unrelated to the Soviet Union. These operations should be the focus of declassification efforts and should strengthen the arguments to be made about the utility of the submarine in regional warfare and crises. These operations include those of submarines during the Vietnam War, during the Yom Kippur War in 1973, the Libyan crises, and during crises in Lebanon.[7]

Related to the efforts to declassify relevant submarine operations, is the need to be more open about submarine capabilities. This will serve two purposes. First, it will help to correct misperceptions that the submarine is only an effective weapon against other submarines. Second, it will contribute to the forward presence potential of the submarine. If the capabilities of US submarines are well-known and publicized, then their effectiveness as instruments of naval diplomacy are greatly increased. A country that is involved in a dispute with the United States, may be more affected by the announcement of the presence of US submarines off of its coast if it understands more clearly what the capabilities of that submarine are. There are a number of ways to increase awareness of submarine capabilities. One method that merits considerable improvement is through the media. There have been efforts to increase media coverage of submarine operations. These efforts, however, have been hampered by a lack of

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[7]Vice Admiral Roger F. Bacon, "Submarine Warfare: It's A-Changing," *US Naval Institute Proceedings*, June 1992, 52. "Submarines have operated in support of nearly every regional conflict or crisis faced by this nation in the past 50 years, including the Korean War, Vietnam, Grenada, Lebanon, and Libya, as well as Desert Shield and Desert Storm."

direction and a continued unwillingness to discuss submarine operations openly.[8] As a result, we see news articles and broadcasts on submarines that deal almost exclusively with the personnel and ignore the regional warfighting capabilities that the submarine has to offer. This approach to public relations must be reevaluated.[9]

The final point of emphasis for the submarine force should be in illuminating the enormous comparative advantage now possessed by the United States in terms of submarine technology. Throughout the Cold War, the Soviet Union expended enormous resources in attempting to neutralize the threat of US submarines. They were never successful. Now, in this new international security environment, there is no country that possesses either the resources or the technological know-how to sustain its efforts to counter the submarine threat.[10] Thus, we find ourselves in a position that US submarines will remain relatively invulnerable for the foreseeable future. This comparative advantage should not be carelessly discarded or allowed to atrophy.

D. ENGAGING THE CONGRESS IN THE DECISION MAKING PROCESS

The Constitution of the United States endows Congress with the responsibility to maintain the Navy. During the Cold War, the submarine community was able to receive support for its programs without dealing with a

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[8] See O'Rourke, "Address to the Submarine Technology Symposium, 13 May 1992," 32-33, or, "Second Luncheon Address," 21-30.

[9] Ibid.

[10] This statement excludes NATO allies and the Soviet Union, see Donald C. Daniel, *Beyond the 600-Ship Navy*. Adelphi Paper 261 (London: Brassey's for International Institute of Strategic Studies, 1991), 34. "Only the Soviet Union, and possibly the UK, have a sufficient capability to pose a sustained challenge to US submarine operations in specific areas or circumstances."

large number of Congressional members. This was due to the environment created by the Cold War consensus. Now that the Cold War is over, this consensus has evaporated, and the submarine force suddenly finds itself without broad support.[11] As a result, the submarine force has come under increasing attack from members of Congress on the individual issues of submarine procurement, submarine force structure, and submarine roles and missions. This new environment necessitates that the submarine force shed its insular ways and actively engage the Congress in the initial steps of the decision making process. By doing so and by emphasizing the need to stay above individual issues and focus on a larger vision, it is possible to deflect individual attacks on specific issues and at the same time build a broad base of support for the submarine force.[12]

Involving Congress in the decision making process of the submarine force may appear to be surrendering to outside interference. During the Cold War, this might have been the case. Now in this new environment, such a policy of Congressional engagement is vital to ensure that the submarine force receives its fair consideration in the defense debate. If the submarine force instead chooses to remain aloof, Congress will still become actively involved in the process. The only difference will be that it will be a Congress that is probably hostile to submarine interests, and that will be making decisions on individual submarine issues rather than based on a broader vision of the submarine force as a whole.

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[11]O'Rourke, "Address to the Submarine Technology Symposium, 13 May 1992," 35, or, "Second Luncheon Address," 21-30.

[12]O'Rourke, "Address to the Submarine Technology Symposium, 13 May 1992," 40-42, or, "Second Luncheon Address," 21-30.

E. CONCLUSIONS

The individual issues of submarine roles and missions, force structure, and design are important and vital to the future of the submarine force. They are however, simply parts of a larger issue: the justification of the submarine as an instrument of national security for the United States. This justification is dependent upon the submarine force changing its frame of reference in the defense debate, participating more fully and actively in the debate, and engaging Congress in the decision making process.

During the Cold War, defense debates were largely concerned with parochial battles over shares of defense resources.[13] There was no need for the justification of defense forces, so that the focus was on individual issues. Now that the Cold War is over, the focus has changed to the justification of specific forces. The submarine force is a common subject of this debate. This change in focus of the defense debate requires a similar change of approach for the submarine force. The frame of reference for the submarine force should change from the individual issues to the contribution of individual issues to a larger justification of the submarine's contributions to US national security. This is necessary to restore the credibility of the submarine force and to effectively counter arguments against the submarine in the post-Cold War world.

Once the frame of reference for the submarine force has been adjusted, it is important that the submarine force participate fully in the ongoing defense debate. This will require that the submarine force shed its insular and secretive

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[13]For recent examples of debates over single issues in the post-Cold War era, see Vice Admiral Robert F. Dunn, "Power Projection: Back on top, but..." *US Naval Institute Proceedings*, February 1991, 13; and Kevin P. Peppe, "Attack Submarines Should: Attack! Attack! Attack!" *US Naval Institute Proceedings*, September 1991, 62-64.

ways. The need for secrecy surrounding submarine operations has evaporated with the end of the Cold War. Declassifying past submarine operations that demonstrate the utility of the submarine in regional warfare and crises will help to correct the misperceptions surrounding the submarine. Similarly efforts to publicize the capabilities and missions of the submarine will help to alleviate misperceptions and strengthen the role of the submarine in naval diplomacy. In addition, efforts must be made to emphasize the enormous comparative advantage that exists in submarine technology due to the demise of the Soviet Union. This advantage has resulted in the relative invulnerability of the submarine in regional contingencies.

Having begun to participate fully in the defense debates, it is equally vital that the submarine force actively engage the Congress in the initial stages of the decision making process involving the future of the submarine force. This will ensure that Congress will make educated decisions concerning the future of submarines, and will also serve to develop and maintain the credibility of the submarine community in the eyes of Congress. If the submarine force fails to include Congress in the initial development of the submarine's future, then Congress will still affect the future of the submarine force through decisions based not on the input of the submarine force but on open hostility to the submarine community and with a focus on individual issues vice long term vision.

VI. CONCLUSIONS AND RECOMMENDATIONS

The end of the Cold War has been the watershed event for change in the international and national security environments. The Soviet Union no longer exists as a tangible global threat to American national security interests. The uncertain threat of regional crises and contingencies has replaced the fear of global war as the basis for US defense forces. This fundamental change, as enunciated in the *National Security Strategy of the United States* and the *National Military Strategy*, requires a comprehensive reexamination of service strategies and programming. This examination is well underway as each service struggles to determine its contribution in the post-Cold War world.

The US Navy has outlined its vision for the future in . . . *From The Sea: Preparing the Naval Service for the 21st Century*. This vision develops a general framework for the contributions of naval forces to the new regional defense strategy. What has yet to be determined is the exact contribution of each element of US naval forces. The submarine force, in particular, is striving to effect a smooth transition from a Cold War posture to a regional defense posture. This transition must include the determination of roles and missions, force structure, future submarine design, and institutional changes to support this new strategy.

Roles And Missions

The roles and missions of the submarine force must not be determined from the perspective of rationalizing force structure, but rather from the perspective of contributions to the new regional defense strategy. This strategy is based upon the four foundations of forward presence, crisis response, strategic deterrence

and defense, and reconstitution. Although these terms have been used to describe strategy in the past, their use today is often very different.

The submarine force contributes to the national objective of forward presence through peacetime engagement, and by enhancing the US crisis response capability. The Navy should assume a greater share of responsibility for forward presence due to the rapid pace of ground-based force withdrawals and overseas base closures. With the declining numbers of ships in the Navy and depending on policy decisions made by the naval leadership, the submarine should be assigned a greater role in forward presence.

The submarine has significant potential as an instrument of naval diplomacy. The submarine can be used for signaling by the United States as either an independent platform capable of conducting cruise missile attacks, or as an element of an even stronger naval force, such as a Maritime Action Group (MAG), or Carrier Battle Group (CVBG). The submarine is valuable as a force multiplier for a MAG, and offers a US-unique comparative advantage as a rapid response-capable forward element for a crisis response force.

The "traditional" role of the forward deployed submarine to enhance crisis response capability is being refocused from a Soviet threat to that of regional contingencies. This provides the operational commander with additional capabilities and significant flexibility in periods of rising tensions. The submarine's enduring strengths make it a flexible platform capable of assuming independent or joint roles in support of forward presence. Although the submarine is still not viewed by many as a viable instrument of naval diplomacy, submarines have been used by the United States in the past to send signals and should be used extensively in the future.

The submarine's unique and multiple capabilities make it a significant contributor to the national objective of crisis response. The submarine has three roles in crisis response: 1) rapid response and offense suppression, 2) joint task force and ground support, and 3) integrated strike operations. The most important role that submarines play in crisis response is that of rapid response and offense suppression. The submarine can arrive on the scene of a crisis faster than any other naval forces due to its ability to conduct sustained independent high speed transits. The transit of a CVBG, on the other hand, is constrained by the slowest ship in the formation and the need to conduct periodic refueling of non-nuclear powered ships.

The ability of submarines to perform offense suppression of sea and land based threats performs two functions for the joint task force (JTF) commander. First, it can reduce the threat to follow-on forces by destruction or degradation of the adversary's capabilities. Second, it forces the adversary to divert his forces from operations against follow-on forces to operations to neutralize the US submarine threat. The submarine is the ideal platform for these roles due to its stealth. Its ability to remain undetected allows it to be inserted into a hostile region without the need for significant defensive support.

The submarine's role in joint task force and ground warfare support is complementary in nature. The submarine can be tasked with missions from either the joint task force commander or unified commander in chief (CINC), or the local battle group or naval expeditionary force commander. In both cases, this support would occur in situations where follow-on forces have arrived and established themselves in the region. Additionally, the submarine will continue its offense suppression efforts, using its ability to operate far forward. The

submarine's unique capabilities also provide the operational naval forces and ground forces commanders with real-time covert intelligence that could prove invaluable to coordination and defense of follow-on forces.

In joint operations, the submarine can simultaneously support both defensive and offensive tasks as designated by the operational commander. . . . *From The Sea,* the Navy's strategy paper, has articulated the joint missions of joint strike, joint littoral warfare, joint surveillance, and joint SEW/intelligence. These missions are supported by the submarine performing the fundamental tasks of anti-submarine warfare (ASW), anti-surface warfare (ASUW), strike, and mine and anti-mine warfare as well as the supporting tasks of special warfare, surveillance, combat search and rescue (CSAR), and intelligence collection.

The ability of the submarine to employ cruise missiles provides the operational commander with additional flexibility and strike capability. "Submarines will not replace traditional carrier aircraft heavy-strike ordnance, but submarine-launched cruise missiles could be the vanguard element that attacks air-defense, early-warning, and communications facilities to reduce the threat against follow-on aircraft."[1] These potential roles of the submarine in crisis response illustrate the applicability of the submarine to regional warfare and demonstrate that the submarine is not solely an ASW weapon.

The submarine force has played a major role in nuclear deterrence, and that role will continue. With the recent agreements on nuclear weapons between the United States and Russia, the importance of the SSBN is growing as ICBMs are de-MIRVed and destroyed. It could even be argued that the SSBN in this post-

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[1]Vice Admiral Roger F. Bacon, "Submarine Warfare - It's A-Changing," *US Naval Institute Proceedings,* June 1992, 53.

Cold War era could shoulder the entire burden of nuclear deterrence. This may be an inviting alternative in a period of declining defense budgets. One role that the submarine has played in the past appears to be changing. That role involves the ability to employ the nuclear variant of the *Tomahawk* cruise missile (TLAM-N), which was previously designed for use against the Soviet Union but now appears to be equally well suited to deterring regional conflicts involving weapons of mass destruction.

The role of the submarine in strategic ASW has not yet changed nor should it as long as potentially hostile countries possess capable SSBN forces. Similarly, as long as the United States maintains nuclear arms control agreements with other countries, the submarine will have value as an irreplaceable national technical means (NTM) of verification. With the exception of regional deterrence, the submarine's roles in supporting nuclear deterrence are still largely related to capabilities remaining in the military forces of Russia. Because of this these roles are dependent upon the outcome of bilateral and unilateral decisions concerning nuclear warhead numbers and deployment methods.

Despite its inability to be reconstituted within 8-10 years from a standing start, the submarine is still a factor in the national objective of reconstitution. The primary goal of reconstitution is to deter an emergent global threat. By maintaining a viable submarine industrial base and maintaining our technological advantages in undersea superiority, the submarine becomes a significant contributor to this goal of deterrence. If deterrence fails, the submarine will provide a means of verifying the existence of an emergent global threat. The concept of reconstitution can be applied to submarines retired early due to budgetary constraints. If feasible, these submarines can be mothballed

similar to conventional ships or placed in a reserve status to reduce operating costs. If a global US threat emerges in the future, these inactivated submarines could be reconstituted faster than the construction of a new submarine. It is important to note that this role has nothing to do with the former Soviet Union as it exists today. Rather, this role deals primarily with the future opponents of the United States. Whether or not they emerge from the remains of the Soviet Union is irrelevant.

This discussion of new roles and missions for US submarines is important for a number of reasons. First, it demonstrates that the notion of the submarine as solely a Cold War weapons system is clearly flawed. The submarine is a very effective weapons system for regional warfare and forward presence as well. Second, the submarine is clearly not solely an ASW platform. Even during the Cold War, the submarine was designed and developed to have multimission capability. Articulation and demonstration of this multimission capability is vital to ensure the proper justification of requirements for future submarine construction.

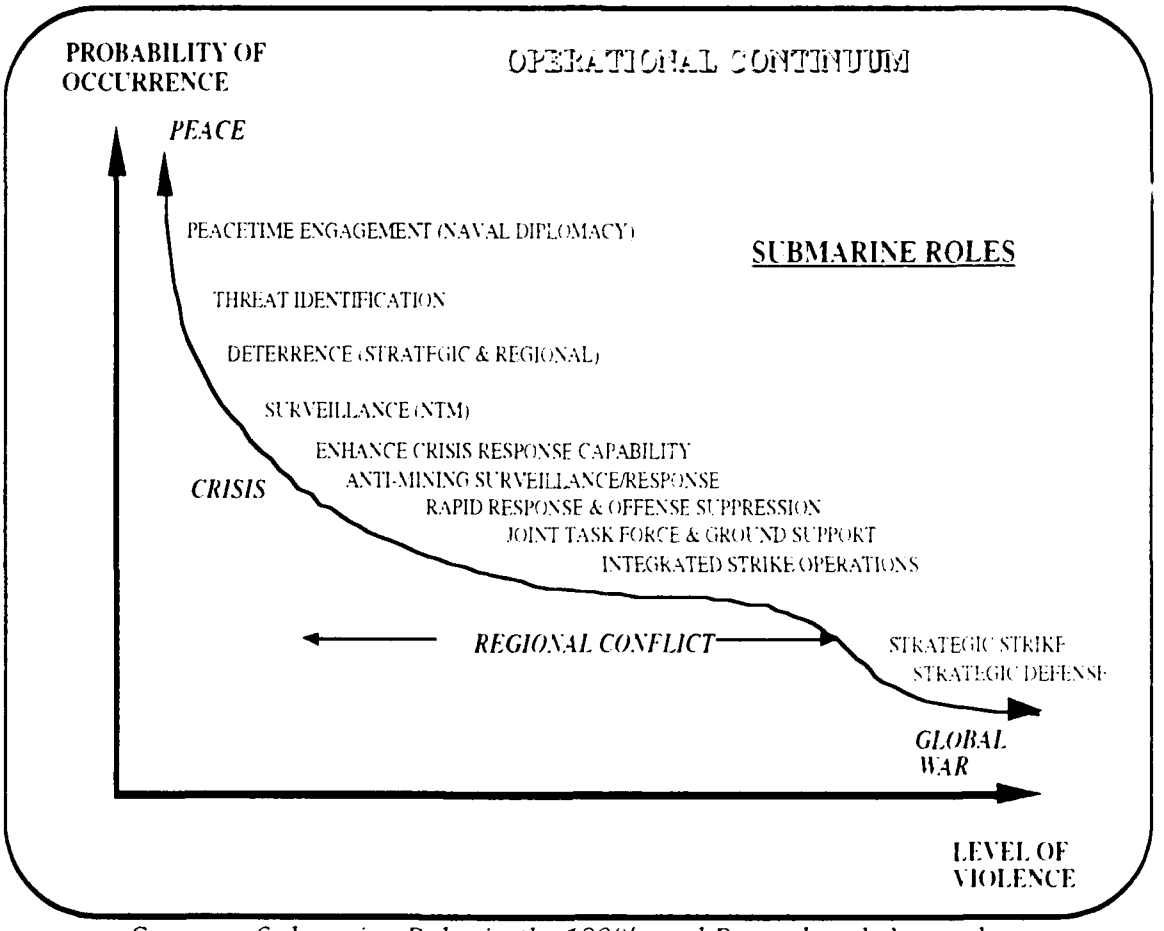
This discussion is not meant to portray the submarine as the ultimate weapon system for the new world order. Instead, the purpose of this thesis is to create an outline of the multiple and various means in which the submarine can *contribute* in this new international security environment. The submarine's unique characteristics of stealth, endurance, and agility as well as its multimission capabilities make it an important contributor to forward presence, crisis response, deterrence, and reconstitution. Table 2 below summarizes these contributions.

TABLE 2. SUMMARY OF SUBMARINE ROLES AND MISSIONS

NATIONAL OBJECTIVE	THE SUBMARINE'S ROLE	RELATED TASKS AND/OR MISSIONS
NUCLEAR DETERRENCE and STRATEGIC DEFENSE	Strategic Nuclear Deterrence (SSBNs)	Strike Warfare against former Soviet Union using SLBMs
	Strategic Defense	ASW against SSBNs (Strategic ASW) Ocean Surveillance of SSBNs GPALS
	National Technical Means of Verification	Ocean Surveillance and Intelligence Collection to verify nuclear arms control agreements
	Regional Deterrence of Weapons of Mass Destruction	Strike Warfare against regional nuclear states using TLAM-N
FORWARD PRESENCE	Peacetime Engagement (Naval Diplomacy)	Forward Deployments and Exercises Multinational Exercises Port Visits
	Enhance Crisis Response Capability	Forward Deployments and Exercises Ocean Surveillance Intelligence Collection
CRISIS RESPONSE	Rapid Response & Offense Suppression	Anti-Submarine Warfare Anti-Surface Warfare Strike Warfare against missile facilities and airfields Mine and Anti-Mine Warfare Intelligence Collection Special Warfare
	Joint Strike Joint Littoral Warfare Joint Surveillance Joint SEW/Intelligence	Anti-Submarine Warfare Anti-Surface Warfare Mine and Anti-Mine Warfare Intelligence Collection Special Warfare CSAR
	Integrated Strike Operations	Strike Warfare J-SEAD
RECONSTITUTION	Deter Global Threat	Maintain Industrial Base Maintain Submarine Superiority
	Threat Identification	Intelligence Collection Ocean Surveillance

In looking at these roles and missions for the submarine, one should realize that the hierarchy of the four foundations of the regional defense strategy is in a state of transition. During the Cold War, nuclear deterrence and forward presence were the high priorities. Now, with the focus on regional warfare, forward presence and crisis response are becoming the highest priorities. Figure 5 illustrates the new emphasis for submarine roles. As the emphasis for roles and missions changes, this requires a reevaluation of submarine force structure and submarine design. This ensures that they are still supporting the main focus of submarine operations.

Figure 5. Submarine Roles In The Operational Continuum



Source: *Submarine Roles in the 1990's and Beyond* and the author

Force Structure

Today, the issue of force structure in the Department of Defense is a contentious one. The debate is ongoing not only in the Pentagon, but in the halls of Congress as well. It is important to note that the debate over force structure does not simply involve raw numbers of ships. It also involves the necessary organization of the Navy to effectively utilize its diminishing assets. Efforts are currently underway to reorganize the Navy headquarters in order to respond to the changing national security situation. Similar efforts are being considered at the fleet level in order to effectively integrate a smaller Navy. These efforts should include reorganizing the submarine force into functional elements that allow for operational specialization. This specialization will add to and strengthen the capability of deploying battle groups by integrating submarines into the administrative and operational organization of cruiser-destroyer groups. In addition, the ability of submarines to operate independently for fleet, JTF, and unified CINC disposal should be maintained using the current submarine organization.

In discussing the future size of the submarine force, the discussion should be divided into short term and long term factors. In the short term, the concern will be over how to effect the transition from Cold War submarine force levels to regional defense force levels. Thus, the primary questions concern what factors will affect the rate of reduction or glide slope of submarine force levels. The main factors that will affect the glide slope of the submarine force in the short term are primarily political or economic. Concerns over the submarine industrial base and its effect on local economies in New England and Virginia will have

some effect, however, they are not substantial in the short term due to the small number of submarines it appears will be necessary to maintain the industrial base (one per year).

The primary short term effect on submarine reductions will be the economic factors associated with retiring submarines. It costs significantly more to retire a nuclear submarine than to operate it. As a result, those desiring quick benefits from a "peace dividend" will be required to spend more in the short term if they attempt to retire submarines faster than currently planned. Other options include "mothballing" submarines that have not reached end of life, or simply tying up submarines and manning them with skeleton crews to save operating costs. The last factor that will affect the glide slope of submarine reductions in the short term will be the international environment. If the post-Cold War world continues to be characterized by the absence of a global threat to the United States, then it can be assumed that submarine reductions will continue as planned or be accelerated.

There appear to be three main factors that will affect the ultimate levels of the submarine force in the long term. Perhaps the most important of these is the submarine industrial base. Ongoing studies of this issue should determine a baseline below which submarine procurement cannot fall without affecting the viability of the industrial base. Note that this *de facto* floor will be affected by the decision to maintain either one or two submarine shipyards. A limiting factor in long term submarine force levels will be the impact of declining resources on both the federal budget and the defense budget. Efforts to contain a persistent budget deficit, and consolidation of roles and missions to reduce inter-service redundancy may contribute to *limiting* submarine force levels.

The final factor affecting long term force levels will be the input from the military, primarily based upon the requirements of the Navy and the unified CINCs. Assuming that a global threat does not emerge to threaten US interests, these requirements proposed by the military will probably serve as *ceilings* for submarine force levels. This discussion of force size should illuminate some important points. The most important is that both the short term and long term factors affecting the rate of submarine force structure reduction and the ultimate force structure level are primarily economic and beyond the control of the Navy and the Department of Defense. This does not imply that the Navy should cease in stating its case in the current debate, but that it be aware of these other factors in addition to the traditional inputs for force levels provided by the military.

Future Submarine Design

The issue of submarine design is currently a hot topic due to the decision to cancel the *Seawolf* submarine program. Besides the current political arguments, submarine design is important because it reflects the long term direction of the submarine force. Because of the rapid pace of both international and domestic events, the issue of submarine design must be looked at from both short term and long term perspectives.

Submarine design in the short term will be affected primarily by issues unrelated to military utility. The primary factor affecting design will be the issue of the submarine industrial base. The reason that the construction of the follow-on submarine will be so closely tied to the submarine industrial base issue is the fact that the submarine force cannot justify its current force size on existing requirements. The industrial base issue will determine when the new submarine must be constructed in order to maintain the viability of the industrial base. This

time factor will determine the magnitude of change that can be included in the new submarine design.

A second related factor will be affordability. The need to provide a submarine that is both capable and affordable is vital to ensure that the US will continue to field a submarine force that is as capable as the one that exists today. A third factor is the ability of the new submarine design to incorporate changes that increase the regional warfighting capability of the submarine. This, along with the issue of affordability, is vital to overcoming the stigma that submarines are too expensive and designed solely for the Cold War. A final factor in the short term is the perceived effect of continued *Seawolf* production on the Russian republic. The US cannot afford to send the wrong signal to military authorities in Russia by continued construction of a submarine designed primarily to counter a former-Soviet threat.

These four factors are distinct but interrelated. They reflect the short term requirement of submarine design as that of maintaining the capability of the submarine as a weapons system for the United States through the production of a capable but affordable submarine that ensures the viability of the submarine industrial base. The short term requirement is <u>not</u> that of maintaining submarine force structure, which is shrinking. It is to retain a US comparative advantage.

In the long term, the approach to submarine design must make minimal assumptions in order to deflect criticism that it is stuck in the Cold War. It must concentrate on the areas needed to produce a regional warfighting submarine. This includes a return to the issue of submarine propulsion. Air independent propulsion (AIP) as a potential propulsion means for submarines should not be ruled out in the future. The critical factors that AIP must be able to meet are

speed, endurance, and affordability in comparison to nuclear propulsion. Conventional or diesel propulsion is also an option, however, it has distinct disadvantages compared to nuclear propulsion. These disadvantages would require a fundamental adjustment of submarine roles and missions and a policy of forward basing that appears to run contrary to current US policy.

The regional warfighting submarine must have a design emphasis on those weapons that will be used in joint regional conflict. This translates into the ability to carry large numbers of cruise missiles and fire them rapidly. In addition, the need for carrying large numbers of heavy torpedoes will be significantly reduced. One other consideration is the development of a "proportional response" weapon capable of disabling, vice destroying, vessels engaging in drug/weapon smuggling, minelaying, or piracy. These are fundamental changes from past submarine design requirements.

In order for the submarine to be an effective contributor to a regional conflict, it must be able to expand its battlespace and maintain contact with other forces. The current battlespace of the submarine appears to be platform limited. As a result further expansion of the battlespace requires the use of unmanned vehicles. These vehicles can be used either underwater (UUVs) or in the air (UAVs) in order to vastly improve the submarine's horizon and its effect on the conflict. The need for the submarine to maintain contact with other forces is paramount in this new emerging era of joint integrated operations. If the regional warfighting submarine does not have the means to communicate effectively and consistently with other forces, its major role in regional warfare cannot be justified.

The extent of submarine platform design appears to have reached its zenith with the *Seawolf* program. The submarine's best defense is its ability to remain undetected. As a result, the current performance characteristics of the *Seawolf* should be maintained as a baseline, while research and development should focus on the means to maintain that performance while reducing costs.

Finally, in the rush to redirect the submarine design process towards a regional warfighting emphasis, it is important to note the historical development of submarine design. Throughout its relatively brief history, the submarine has been able to adapt to tremendous changes in the international environment. This is due to its flexibility in design. While additions were made in submarine capability, old capabilities were maintained. The result has been a multimission capable platform that is flexible enough to respond to the demands of the post-Cold War world.

In designing the regional warfighting submarine of the future, there are three options to ensure that design flexibility is maintained. One is to continue current practice and design a multipurpose platform capable of operating across the spectrum of conflict. A second option is to design two classes of submarine, one to deal with the specific requirements of regional warfare, the other to maintain design flexibility and multipurpose, full warfare spectrum capability. A third option is to apply modular construction techniques to a basic submarine design.

The short term issue of submarine design appears to be taking center stage due to the concerns over the submarine industrial issue. It is important that the Navy also take a long term view of submarine design and confront the issues that need to be faced in the transition to a regional warfighting capability. It appears

that the *Seawolf* submarine program is being seen as the transition to the post-Cold War era, and the *Centurion* program will be the first post-Cold War submarine. Looking at this issue objectively, it will be very difficult for the *Centurion* to completely divorce itself from many Cold War design characteristics simply due to the short period of time that will be required for actual construction of the first ship. Using the *Centurion* project as a springboard, the Navy should begin concurrent development of a regional warfighting submarine that will begin production in the early 21st century in order to replace the *Los Angeles* class submarines as they are retired.

Changing Directions

The individual issues of submarine roles and missions, force structure, and design are important and vital to the future of the submarine force. They are however, simply parts of a larger issue: the justification of the submarine as an instrument of national security for the United States. This justification is dependent upon the submarine force changing its frame of reference in the defense debate, participating more fully and actively in the debate, and engaging Congress in the decision making process.

During the Cold War, defense debates were largely concerned with parochial battles over shares of defense resources. Now that the Cold War is over, the focus has changed to the justification of specific forces. The submarine force is a common subject of this debate due to its enormous procurement costs. This change in focus of the defense debate requires a similar change of approach for the submarine force. The frame of reference for the submarine force should change from the individual issues to a larger justification of the submarine's contributions to US national security. This is necessary to strengthen the

credibility of the submarine force and to effectively counter arguments against the submarine in the post-Cold War world.

Once the frame of reference for the submarine force has been adjusted, it is important that the submarine force participate fully in the ongoing defense debate. This will require that the submarine force shed its insular and secretive ways. The need for secrecy surrounding submarine operations has evaporated with the end of the Cold War. Declassifying past submarine operations that demonstrate the utility of the submarine in regional warfare and crises will help to correct the misperceptions surrounding the submarine. Similarly efforts to publicize the capabilities and missions of the submarine will help to alleviate misperceptions and strengthen the declarative role of the submarine in naval diplomacy. In addition, efforts must be made to emphasize the enormous comparative advantage that exists in submarine technology due to the demise of the Soviet Union. This advantage has resulted in the relative invulnerability of the US submarine in regional contingencies.

Having begun to participate fully in the defense debates, it is equally vital that the submarine force actively engage the Congress in the initial stages of the decision making process involving the future of the submarine force. This will ensure that Congress will make educated decisions concerning the future of submarines, and will also serve to develop and maintain the credibility of the submarine community in the eyes of Congress. If the submarine force fails to include Congress in the initial development of the submarine's future, then Congress will still affect the future of the submarine force through decisions based not on the input of the submarine force but on open hostility to the

submarine community and with a focus on individual issues vice long term vision.

A Vision for the Future

The submarine force must integrate these four issues of the future into a long term vision. The focus of this vision should be the beginning of the next century. This should be the period that the submarine force should target to fully complete its transition to a regional defense force. This transition will take place in roles and missions, force structure, submarine design, and the submarine community as an institution.

To begin this transition, the submarine force should state its target for force levels at the beginning of the next century. This target should include the levels projected by the Navy and the unified CINCs that will meet requirements based solely on roles and missions supporting forward presence and regional crisis response. Additionally, this target should include the levels deemed necessary to maintain the viability of the submarine industrial base assuming the maintenance of either a single submarine shipyard or both current shipyards. The limiting factors for this target should also be presented, including tradeoffs that may be necessary to support other ship construction requirements or assuming various budget levels. This target and its supporting rationale should be presented to the Congress now to ensure that they can participate fully in the final determination of submarine force levels in the future.

Concurrent with this presentation of a force level target, the submarine force must present its plan for the transition of current force levels to the projected force levels of the next century. This transition plan should include the timetable and costs associated with the retirement of older submarines. If the target force

level is such that it will require early retirement of *Los Angeles* class submarines, the submarine force should develop plans now for either "mothballing" these ships or inactivating them to reduce their operating costs.

In terms of submarine design, the submarine force must make it clear that neither the *Seawolf* nor the *Centurion* programs are necessary to support projected submarine force levels until the next century. As a result, any decisions to build these submarines must be clearly identified with the need to maintain the viability of the submarine industrial base. As part of the long term vision of the submarine force, a concurrent design project of a modular SSXN submarine should be initiated. This submarine should be viewed as the baseline submarine design that will provide the platform for the first true regional warfighting submarine (SSGN), the successor to the *Trident* class submarine (SSBN), if needed, and the successor to the *Seawolf* class submarine (SSN), if needed.

In coordination with current efforts to restructure the Atlantic and Pacific fleet organizations, the submarine force should begin the integration of submarines into the cruiser-destroyer groups of the surface navy to enable the submarine to more effectively conduct its joint missions. Concurrently, the submarine force should create submarine strike squadrons that can carry out the independent roles and missions required of the submarine force. This reorganization should be targeted for completion by the turn of the century in conjunction with other transition efforts.

Finally, it is vital in the transition of the submarine force to a regional defense posture that the submarine community shed its insular ways. Classification requirements for submarine capabilities should be reviewed and possibly eliminated. More attention should be paid to publicizing the contributions of the

submarine to regional warfare including using the extensive and thoughtful participation of the news media.

This vision of the future is already well on the way to being articulated and implemented by the leaders of the submarine community. It is important that the submarine community embrace this sudden and dramatic transformation rather than resist it. The choice is clear. The submarine force can be the major determinant of its own future, or else it can resist change and let others determine the path of the submarine force of the future.

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